

SHED SOME LIGHT ON YOUR

TAPE PROBLEMS
SEE inside
COMPUTER-LINK (UK)
page 18.

NEWS IN BRIEF

Nick Bark leaving PEDS

NICK BARK, managing director of Perkin-Elmer Data Systems' European operation for the past three years, has resigned to become president of European operations for a large US electronics company which is planning to break into markets on this side of the Atlantic. The company is understood to be one of the leaders in the defence market.

Bark joined Interdata, as it was then, in 1976 when the European operation had sales of \$7 million a year and a staff of about 60. Sales for the present year are expected to be about \$45 million and UK staff alone totals 200.

More disc power

FNHANCING the specifications of the yet to be delivered System 38 database-oriented business computer, IBM has announced that up to four of its 570 Mbyte 3370 fixed disc drives can be fitted to the 38/5. Total cost, including adaptor, is £68,207, or £33.50 a Mbyte.

Shipping launch

A MONTHLY magazine called, Lloyds Shipping Economist with detailed analyses of world shipping developments was launched this week by Lloyds of London Press. Its contents are largely based on reports generated by Lloyds Digital Equipment PDP-11/70 system at Colchester, from Lloyds' own database on ship movements and from technical data supplied by Lloyds Register of Shipping.

Growing role

SPECIALIST services for Univac's BC7 small business computer are likely to be a growing part of the business of Guardian Computer Services, of Manchester. An approved Univac software house, the company has installed a 128K BC7 in its new premises at St James' House, Pendleton Way, Salford, Manchester 6.

Wyly Corp chairman replaced



Wyly

SAM WYLY, who founded the University Computing Company in 1963, has been replaced as chairman and chief executive officer of UCC's parent, the Wyly Corp, by John Kason from the UK. Wyly's share in the Dallas, Texas, company was reduced from 11% to 2% last year when its principal creditor, Cereol Holding of Zurich, took a controlling interest.

Wyly Corp ran into serious financial trouble in 1976 after the collapse of its ambitious microwave-based data network, Datran.

To avoid having to seek protection under the US bankruptcy laws, Wyly settled its debts with a recapitalisation plan under which creditors were offered 100 shares and \$110 cash for every \$1,000 they were owed. Carval Holding, which had put \$50 million into Datran, ended up with 51% of Wyly Corp stock.

Cereol's relationship with UCC began in the late Sixties when Cereol's boss, Walter Hafner, sold his Zurich-based Automation Center bureau network to UCC and took a minority share in the Dallas company.

Sam Wyly told Computer Weekly that his only involvement with Wyly Corp now was as an adviser to the company on its \$300 million anti-trust suit against AT&T, the US telecommunications giant. Wyly Corp is charging AT&T with introducing unreasonably low rates for data transmission services in 1974 which made it difficult for Datran to sign new customers.

The other leading European in the Wyly Corp story, John Kason, joined UCC when the latter acquired Computer Services (Birmingham) Ltd in 1967. He rose through the ranks, being elected to the board of the Dallas company in 1974, and was made president last year (CW, March 9, 1978).

UCC says that Kason "saw through" last year's recapitalisation.

Burroughs regroups for office of the future

BURROUGHS is strengthening its resources in the electronic office area, according to observers in the US.

A special Office Automation division has been set up within the Office Products Group, and a bid has been made for Context Corp, a privately-owned maker of OCR machines based in Burlington, Mass.

The Office Automation Division will include WP maker Reductron and fax company Graphic Sciences, and will be managed by Dal Berry, former president of Graphic Sciences.

Nippon introduces new Acos in response to the 4300s

FIRST off the blocks in Japan to respond to IBM's new 4331 was Nippon Electric with a new model in its Acos-77 line.

Called the 77/250, the new machine falls between the 200, based on Honeywell Level 62 licences, and the 300, based on CII-Honeywell Bull Level 64 licences. It is not clear to which family the new machine belongs.

NEC says that it will initially be delivered with 10K memory chips, but will have 64K chips from next January.

Key features of the new machine include new control processor, communications controller supporting up to 64 workstations, and a separate disc controller. A new Codasyl database called ADBS has also been introduced, together with interactive software for online

program development, making the machine a competitor for the IBM System 38 as well as the 4331.

The 4300s have not yet been announced in Japan, and observers believe that the government is trying to persuade IBM not to price them too competitively, lest they drive the indigenous manufacturers out of the low-end mainframe market.

Expanding

AS a result of expansion in business, the Neill Group of engineering and tool companies is to replace its Univac 1106 with 512K 1100/80 system.

Speaking from Modcomp's Fort Lauderdale, Florida headquarters, Giles told Computer Weekly that the minimaker submitted revised accounts for 1975 to 1976 to the US Securities

strongly rejected a widely-touted rumour that GEC had come back for more talks.

Thorn is seeking to diversify into the microprocessor applications and communications fields, and already has a UK joint venture with Ericsson of Sweden on private digital telephone exchanges.

Although Modcomp does not precisely fit the profile of the company Thorn is seeking, and Thorn would neither confirm nor deny its interest, sources indicate that not only is Thorn bidding but that it is the front-runner.

The other multinational company interested in Modcomp is likely to be Northern Telecom of Canada.

Thorn has announced that it has conducted studies in the microelectronics field with a view to making acquisitions in the US and Europe, and sources say that it has independently identified several US companies already studied by GEC as possible acquisition candidates.

GEC held abortive part-acquisition talks with Modcomp last year, and was thought to have reopened negotiations (CW, January 11).

Speaking from Modcomp's Fort Lauderdale, Florida headquarters, Giles told Computer Weekly that the minimaker submitted revised accounts for 1975 to 1976 to the US Securities

Police drop 'suspect' plan

THE controversial plan for a national network of police computers holding "intelligence" on suspects rather than hard facts about convicted criminals, has been dropped.

An experimental system at Thames Valley Police Headquarters at Kidlington in Oxfordshire (CW, November 30, 1978) resulted in considerable objections from organisations such as the National Council for

Civil Liberties because it was used to store what is said to be hearsay about the characteristics of named individuals.

The decision to drop the plan was made by a committee of senior police officers and Home Office officials headed by Ken Oxford, Chief Constable of Merseyside. He said that the Thames Valley system had "inherent dangers."



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Council assurance on police sharing

ASSURANCES have been given by Doncaster Council that proposed sharing of its computer facilities by the magistrates' courts and police station will not jeopardise information held on the system.

The courts will have two 72 and the police one.

"It is not an actual link," said a council spokesman, "the courts and police will be using our processing power to produce documents on court cases and judgments of various lines via ICL 7502 terminal packages."

"And while there will be communication over the leased lines, the whole system is approved by the Office. The real point is that our computers have been tight for some time and it is sufficient to date this plan without being added."

Toy firm's upb

EXTENDING its power, Thomas Sater, manufacturer of Glenfold, upgraded to a 128K Burroughs 1130 system from a 64K. It is at present being used for production management accounting routines.

Briefing Cavenham will switch to 2900

THE Allied Suppliers supermarket division of Sir James Goldsmith's Cavenham group is to switch to ICL 2900 and VME/B. Currently running a System 4/72 and 4/50 at its Hayes, Middlesex computer centre, Allied is to start installing a dual ICL 2900 system worth £1.6 million, in August. The first processor will replace the 4/50 and be used mainly for development and VME/B.

DG 32-bit mini

THE 32-bit mini has resurfaced in Data General's plans. After denying last year that the company had plans to enter the 32-bit mini market (CW, February 9, 1978) senior vice-president Herb Richman has commented in Australia, "You could say that we have not turned our back on 32-bit minis," indicating that the product could appear "in about a year".

2900 line halted

PRODUCTION of ICL 2900 and System Ten systems at the company's Letchworth and Stevenage manufacturing sites is being affected by a two-week-old unofficial strike by over 1,000 workers who are demanding a 15% pay increase. The company's offer of 8% plus an improved sickness benefit scheme on top of the nationally agreed productivity scheme has already been rejected, and no further talks are planned.

Peripheral aid

TO alleviate the UK's balance of trade deficit in computer peripherals, special aid should be given to manufacturing of peripherals in the UK, particularly in the areas of big discs and printers, according to the Noddy Computer Sector Working Party. The SWP also feels the government should push more in the development of standards, and continues to be worried about the lack of a co-ordinated national scheme for training in the computer industry.

Nitachi move

JAPANESE electronics giant Nitachi is looking to Europe as the possible site of a new microelectronics factory. The new location is West Germany, where fellow Japanese manufacturer NEC already has a plant, but the UK, with its attractive government funds, has not been ruled out.

Trap feared

OBSERVERS suspect a hidden trap for plug-compatible peripheral vendors and users in the new IBM policy of supplying operating software for the 4300s. "I/O/E" matched to the user's specific configuration, IBM declines comment, on whether I/O/E's will recognise IBM supplied memory and peripherals.

What Scotland Yard holds on intelligence system

THE veil of secrecy over Scotland Yard's intelligence computer system was lifted slightly this week when Assistant Commissioner John Wilson listed, on the BBC2 programme Man Alive, the five categories of information held on the system.

Hitherto the Home Office has refused, even in answer to Parliamentary questions, to say anything more about the machine than that it contains indices of crime, criminals, and their associates.

According to Wilson, the categories are: fraud; from the files of the Fraud Squad; drugs; illegal immigrants (these last two from the Central Drugs and Illegal Immig-

gration and Intelligence Unit); serious crime, from the Serious Crime Squad; and Special Branch files.

In the same programme the controller of the Police National Computer at Hendon, in response to probing from BBC reporter, Jenny Conway, admitted that some of the information held on the PNC was not strictly factual.

There is space on records there for officers to insert comments such as suspicions about motor vehicles and the like, indicating vehicles and people the police have an interest in tracing, he said.

The PNC ostensibly records only criminal

records, wanted and missing persons, and vehicle ownership.

Wilson's revelations on television were apparently an indiscretion, and have angered Labour MP Jo Richardson (Barking) who intends to ask the Home Secretary why she was refused such information in response to a Parliamentary question.

Further to last week's report that plans for a nationwide police intelligence system have been dropped (CW, February 22), the Home Office has denied that any such plans existed. It affirms, however, that the Thames Valley experimental intelligence system is to continue in operation for another year.

Burroughs challenge to 4300

FIRST US mainframer off the mark with new models specifically priced and configured to meet competition with IBM's 4300 line is Burroughs — and one of the new machines sets up a numbering clash with ICL's 2800 line.

The new machines are the first models in Burroughs' new generation "400" family and fall into the medium scale range, replacing B2800 and B3800 models.

Announced in the US last Friday and set for April launch in the UK, the new machines are the B2930 and the B3950.

The B2930 has a starting price of \$140,000 including the MCP operating system, and comes with 512K or 1M-byte of main memory. Burroughs says that it is twice as powerful as the 2800 model it replaces, and 30% cheaper. It is also slightly more expensive than the IBM 4331, but claimed to be more powerful.

The 3950 has main memory ranging from 2 Megabytes to 5 Megabytes, offers three times the power of the 3800 model it replaces for the same price, and at a starting price of \$250,000 is a little cheaper than the IBM 4341.

Roberts moves to GEC

DEREK ROBERTS is to leave Plessey at the end of April, and will be joining GEC as director of research, and head of the Hirst Research Centre, Wembley, one of the largest electrical and electronic laboratories in the UK.

In his new position, he will report to Robert Clayton, technical director of GEC, and chairman of the new GEC-Fairchild semiconductor company.

At Plessey, as divisional managing director and chairman of Plessey Microsystems and Plessey Semiconductors, he was responsible for Plessey's own research efforts at the Allen Clark Research Centre at Caswell, Northants.

Customs blame agents for faulty figures

INCORRECT entries from export and import agents are emerging as the cause of gross inaccuracies in the 1978 overseas trade figures for analogue and hybrid computers revealed in Computer Weekly last month (CW, February 8).

The Customs, which tabulates the figures, has thanked Computer Weekly for pointing out the inaccuracies.

According to the figures, exports of analogue and hybrid machines grew at a phenomenal rate, from less than £13 million in 1977 to nearly £73 million in 1978. The import figures also showed a dramatic increase, from £7 million to £13 million.

Customs told Computer Weekly, "Preliminary examination of entries on export/import documents (from agents) under the heading of analogue and hybrid data processing machines suggests that items have been included that should not have been."

● Turn to page 17.

Fujitsu in talks with UK software houses

THE need for distributed processing software for its U-series of minicomputers has led Japanese manufacturer Fujitsu to initiate talks with several UK-based software houses, including CAP, Scicon and Leasco.

Fujitsu has its mainframe communications software in place but needs complementary minicomputer software for its mainframes, acting as either node computers or terminals. The Fujitsu U-series is an original design, but has a similar

bus structure to the Digital Equipment PDP-11.

Japanese users expect to get software at no cost, which has led to software expertise being concentrated in the mainframe manufacturers. There is therefore no independent software and systems industry comparable with that in Europe.

A delegation from the major Japanese manufacturers will visit the UK in April with a view to establishing UK-Japanese collaboration on software (CW, February 16).

COMPUTER WEEKLY'S INSIDE NEWS

GSA NEW VENTURES

Spreading the gospel to UK industry about word processing, promoting the training of computer staff, tackling the problem of software copyright, and working with overseas bodies on problems of regulation are all among the new ventures of the Computing Services Association. Rory Johnston reports Page 3

£16,000 PACKAGE

A package worth £16,000 is the current being offered to a northern regional newspaper for a small-scale news system (CW, Feb 23). The advertisement is in the Computer

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JOB OPPORTUNITIES: PAGES 20-63

Star entry

CLOSING date for Computers 78 is March 10, so don't miss the chance of entering your team. An entry form is on page 17 and full conditions of entry were published in Computer Weekly on February 18.

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1984 and all that . . .

THIS week's example of the funny things people say in the media about computers was sent in by Rose Peltu, of Hampstead, who wins £5. The cutting is from the letters page of the Weekly News.

The standard of refereeing leaves a lot to be desired. So what to do that hasn't already been tried?

In this electronic age, it shouldn't be beyond the experts to devise a computer, programmed to accept signals from miniature TV cameras positioned strategically around the pitch so that all angles are covered.

These would produce a clear picture of any unfair incident. The computer would send out a short, strident wail. Play would stop immediately.

A computer controller, who would, in effect, be replacing the referee and be seated high in the stand, would make a verbal announcement of the offence. — A. HILDER, 81 Leonards (E3 letter).

What a fantastic idea! Next step, of course, would be to have robots as players — although some to think of it, many are already playing like robots! (Editorial comment).

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DIGITAL MICROSYSTEMS LOW COST RELIABLE COMPUTERS

A lesson in management from Japan

WITH British management coming under Princes scrutiny last week, a look at the style of management in one of our most successful trading competitors, Japan, seems timely.

We have all read about blissfully happy employees, the concept of employment in one company for life, and the fact that apparently nobody ever gets laid off by a big company, regardless of how much production is automated. At worst, surplus employees end up doing socially useful things like sweeping the lawns outside the factory.

Who are the managers responsible for the apparently highly desirable state of affairs in Japanese industry?

First of all, as likely as not, they are engineers. In Japanese society, wedded to status, engineers come near the top of the tree. According to John Prentice, Counsellor for Science and Technology in Tokyo for the past three years, a good 60 per cent of top managers in Japan are engineers — and engineers are typically paid 10 per cent more than their peers in professions like law.

One of the major problems in the UK appears to be that individuals become too indispensable too early in their careers — so vital in one particular role that time spent on acquiring experience of a broadening rather than a specialist nature cannot be economically justified.

In Japan, this does not appear to be the case at all. On the contrary, once a potential high flyer has achieved a basic grounding and done some useful work in his specialisation — typically four years at university, six months additional training with the company and then four years "on the job" — he is transferred to something totally different.

Thus a software engineer working for, say, Hitachi or Nippon Electric may go into sales for three or four years at the age of about 27. Or he could become the company's overseas representative in a strategic post like New York or Frankfurt, monitoring the local computer industry and Press for his employer back in Tokyo, and providing insights into his company's business to anyone interested.

After that, he may go into

another interim posting, perhaps personnel management, or he may return to his specialisation, at which point, after a refresher course, he will be regarded as someone well fitted to head a development effort.

He will have lost no seniority as a result of his time "off the job"; on the contrary he will be more highly regarded for it.

At the age of about 35, he will learn whether he is marked out for the very top, or whether he will spend the rest of his career in the lower echelons of management.

We say that we could not afford to "waste" key people in posts not directly related to their expensive training and hard-earned experience. And yet typically these key people are soon lost to the company which "can't spare them," through the rigours of pay restraint and the temptations put in the way of

top staff to entice them into another company.

The need for new challenges and new surroundings is one of the factors which sways people to make such a move and this, at least, could be provided by giving key people extended experience of other parts of the company.

This is not to say that training programmes in British companies do not frequently give individuals a taste of various parts of the business in their earliest years. But it is only during the earliest years, and it is typically no more than six months in sales or production.

The key difference is that in Japan this continues much longer into an individual's career, and the periods in different occupations are for three or four years — long enough for the embryo manager to do an effective job, rather than simply see how it is done.

The negative side of the Japanese system is summed up in the fact that they are typically innovative only in applying technology imported from the US and Europe, and that new small, high technology companies are much less likely to be formed by disgruntled individuals who feel they know better than their big company employers.

For example, Japanese visitors look in amazement at the array of highly innovative software and systems houses in the UK and say they have nothing like that in Japan.

On the other hand, Japan still has five major mainframe manufacturers while Europe, almost three times as large, has only 24.

And wouldn't it be salutary for all those creative designers in companies like ICL to have to go out some time and actually try to sell the machines they had designed?

Watch out for the Bogle Str

IF you live in Lancashire, forget to look out for the walkers in the annual Stroll this weekend. This is organised by the student UMIST as part of the Manchester and Salford Reg. sponsored by Computer Week.

Each year about 3,000 walkers enter and Bogle 79 is expected to raise about £18,000 for the charities.

The walkers start the Stroll at the UMIST campus at 11.30 pm this Friday, in Manchester the route takes walkers to Worsley, Alton, Wigan, and then north to Standish, Chorley, returning to UMIST via Black Rod and Swinton. The first walkers are expected home at 7 pm.

To help process details, teams a batch system has been written in Cobol will be used on the University Manchester Regional Centre.

During the walk the Centre Pests will be used to minimise the checkpoints to a CTL MOD 1 computer UMIST. This system is used to provide communications between all checkpoints and the use of vans, bus marshals.

French view

DESPITE firm indications that the business consortium established a private viewdata service based on UK Prestel system, the PPT told Computer Weekly no approval for such a had been sought.

Time runs out for Freedom of Information Bill

THE Committee Stage of Clement Freud's Freedom of Information Bill finished last week, leaving supporters with the task of trying to get more debating time allocated to it when it returns to the floor of the Commons for Report Stage on April 6. About five hours will be available for it on that Friday — not nearly enough for consideration of the Bill's 40 clauses.

Both front benches appear more determined that the Bill shall not go through, so it will be difficult to persuade them to give up more time to it.

The Bill is as yet in more or less its original form, most government amendments having

been defeated in the Committee, which contained a sizeable number of Freud's supporters.

One change that was made, however, was that appeals to the Ombudsman over the operation of the Act would have to go through an MP as at present, not directly as had been proposed.

It is expected that the government will introduce major amendments at Report Stage that may cancel out the central purpose of the Bill.

The First Division Association, the trade union for top civil servants, has announced that it is not opposed to the Bill, but is

concerned that it does not give enough protection from exposure to "intra-governmental communications". These would be advice given by civil servants to Ministers about contentious policy issues, and the FDA feels it is essential to be able to keep these secret, as is done in other countries that already have Freedom of Information Acts.

The Association says that, should the Bill become law, its members will seek to implement it as effectively as possible, but there is concern over the "additional administrative burden" that will arise. This needs to be quantified now, the FDA asserts.

Bigger and earlier Compec

THE overwhelming success of Compec last December, when attendance doubled to nearly 28,000, means a further enlargement for 1979.

All the firms that wanted to exhibit could not be accommodated, and Olympia's National Hall was crowded with visitors throughout the event.

So Compec 79 is moving to the larger Grand Hall at Olympia.

Originally, the National Hall had been re-booked for the same time, in December, but the move into the larger hall also involves a move of date.

Compec 79 will now be held on November 6, 7 and 8. "By the close of the 1979 show, space bookings were flooding in at such a rate that we knew we would have to think again," says Iliffe Promotions, which organises Compec on behalf of the sponsors, who include Computer Weekly, Data Processing, Systems International, Electronics Weekly, Electron, and Microprocessors and Microsystems.

"Without doubt, Compec is now Britain's finest and most important exhibition of computers, systems, peripherals and software. The enlargement will provide more space for both exhibitors and visitors, and Compec will remain at Olympia for the foreseeable future." Exhibitors have been told of the change, and of the fact that previously-announced charges for stands and space will remain unaltered.

Intel extends its range of systems

STEADILY pushing itself further into the systems market, Intel has introduced two new products this week that extend its capabilities in this area. A third innovation is a 16K dynamic RAM that is a precursor to the company's entry into the 64K RAM race, later this year.

Systems sales already account for some 50% of Intel's annual sales, and the new systems products are expected to help expand this sector. The main introduction is an industrial control system, known as ICS-80.

In essence, this is a chassis rack system equipped with Intel's standard Multibus bus structure as the backbone. Into it can be plugged any circuit board from the company's range of single-board computer systems, which include not only

CPU boards, but also memory and interface systems.

The second introduction is a single-board computer system aimed at the OEM market. Using an 8085 as the CPU, it also includes three other processors operating as slaves. These are 8741 universal peripheral controllers which act as peripheral front-ends to the CPU.

With its 64K RAM scheduled

for introduction by the middle of this year, the new 2118, 16K dynamic memory is seen as an essential precursor. It operates on a single 5V supply, giving it the same pin-out as the 64K part.

With its fast access time of around 80 nanoseconds, Intel sees the part being designed into systems as a stopgap for the 64K memory, which should hit volume production in 1981.

No conflict on bank terminals

NO conflict is expected between Plessey and Univac over marketing of the Bunker Ramo System 90 line of banking terminals. As exclusively reported (CW, November 23, 1978) Univac is to market the Bunker Ramo System 90 line to its mainframe customers in the banking world, including the UK. Plessey will market the terminals to all other UK banking customers.

EMI wins first overseas royalty for CAT scanner

NEARLY three years after the beginning of its legal battles over patent infringement in the US, EMI has been paid its first overseas royalty of \$15 million for the CAT medical diagnostic scanner.

The payment was by Johnson and Johnson which has just acquired the Technicare Corp. Ohio-Nuclear, a subsidiary of Technicare, manufactures and markets CAT scanners, and EMI filed patent infringement suits against the former in July 1976 and February 1978.

Half the payment will be entered in EMI's accounts for the current year, as royalty for sales

already made by Ohio-Nuclear, and half will be entered as future sales are made.

EMI also has suits pending against Pfizer and the US General Electric Company, and hopes that the payment by Johnson and Johnson will encourage the other two companies also to settle out of court.

The American GE is developing the scanner as an industrial inspection device, with an application which scans components of jet engines to find flaws in the metal. EMI says that since its patents cover the principle of CAT scanning, industrial inspection is also covered.

Talisman start delayed

DELAYS in the programming of the last level of the Talisman settlement system at the Stock Exchange have put back two weeks the date it is scheduled to go live — from March 26 to April 6. According to the SE the completion of programming came too close to the start of the period on February 19 so that its testing had to be delayed until

the next period, from March 5.

The SE Council met last week to discuss letters from members about the scale of charges for Talisman and decided to defer the final decision on charges until July when the system should be in full operation. By the autumn about 90% of all stocks will be handled by Talisman. The Council has already conceded that a reduction in the SE's general service charge to members could be made to compensate for the cost of Talisman (CW, February 15).

WP software

WORD processing software capable of handling diagrams of chemical structures has been introduced by Wyder for its screen word processors.

Large Scale Hapas bids to sweep accountancy market

A MULTI-USER turnkey system for accountancy practices has been launched by Hartley Computer UK Ltd. Called Large Scale Hapas, the system is configured round Digital Equipment hardware and includes a novel intelligent terminal designated the VT103.

Established in Brisbane in 1974 specifically to develop accountancy systems, Hartley Computer has enjoyed considerable success with its Hapas system.

In Australia, an estimated three out of every four accountancy practices are said to be Hapas users. There are nearly 500 users worldwide, including 25 in the UK where the company began trading last August.

Nearly all of these are single user systems, built round the Wang 2200 series.

Like this system, Large Scale Hapas features a word processing capability for producing standard reports and also uses character-by-character input checking. It is based on a PDP-11/03 central processor, support-

ing up to six VT103 workstations.

A standard VT100 modified by incorporating a 64K LSI-11, the VT103 is quite similar to DEC's PDT-11 terminal, but has a greater communications capability, transferring data at up to 38,000 chps.

A minimum Hapas system costs just under £9,000, while the smallest multi-user (with one terminal) starts at £18,950. Extra workstations are priced at between £3,500 and £4,000.

IBM 3033 pricing

PRICING on IBM's new 3033 Attached Processor has been clarified by the company (CW, February 15). To upgrade from a uniprocessor, a conversion costing £3,517 is required. The 3038 multiprocessor communication unit required for the attached processor costs £235,900. The second processor, called the 3042 costs £371,070. A second console costing £94,400 is also needed, as is a power distribution unit costing £99,200.

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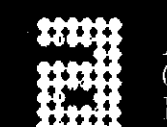


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Ten years ago...

COMPUTER WEEKLY FEBRUARY 27, 1969

GREYHOUND Computer Corp shipped up the Management Dynamics computer bureau from Brooke Bond. Liable for £2 1/2 million in cash. . . The pay and personnel favours of over 100,000 RAN, and the award-winning team of management on a Univac 1107 based system that took 11 years to complete and which was claimed as the largest and most advanced of its kind. . . The National Research

Wilkes Computing Ltd

Specialist in the design and development of interactive terminals for use in hospitals. . . Software File stored with a report that multi-processor systems took up a lot of time and how ICL got round this with its Multics system. . . Wilkes Electronics Ltd, the UK subsidiary of Philips Industries, introduced the 2300 series of office computers.

Modules customised to user requirements

Wilkes Computing Ltd

100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685,

Downtime

by Chad

The gentle art of obfuscation

A READER, G. A. R. Taylor, three weeks ago, was inveighing on our letters page against jargon in computing. A futile task, I'm afraid. Prompted by this, Nick Bell of BICC has sent in a couple of glorious pieces of obfuscation, courtesy of ICL.

Each library list contains a number of catalogued entities, also known as library lists, each of which contains a list of libraries that may be added to the library list. (VME/B System Construction and Maintenance manual).

Definition of a disc: A cyclically re-used direct-access non-volatile file space. (Technical Journal).

Still we cannot claim that computer people have a monopoly on labyrinthine prose. I don't think anything will ever beat the celebrated Admiralty minute:

It is vital for safety reasons that these warheads be stored with the top at the bottom and the bottom at the top. In order that there may be no doubt as to which is the top and which is the bottom for storage purposes, the bottom of each warhead will be clearly labelled with the word "Top."



This is Varian's latest micro-controlled atomic absorption spectrophotometer. So now you know, it's not to be seen that even such wonderful machines as this, when undergoing diagnosis, have to suffer the indignity of being asked to pee in a bottle.

Liverpool chips in

DESPITE the view of foreigners that we Britons are all stick-in-the-muds, our city fathers seem far from slow in taking up the cause of new technology. Only a year ago most of them would have said that California's main export is celluloid rather than silicon, and yet here they all are squabbling in a most unseemly fashion over who is to get Imos.

I see in the Telegraph that Liverpool is now calling itself Silicon City, which I presume will lead to some protest from Bristol. Perhaps we will have Battles of the Chips, with teams from rival areas hurling 40-pin packages at one another. Will it be cheating to sharpen the pins on a whetstone? Then there'll be press gangs roaming the streets, rounding up stray electronics engineers who still misguidedly want to stay in the South-East.

There has been a heated correspondence in the Liverpool Echo over whether effort should be spent on Saving the Lyceum, a relic of bygone days, or whether the time should be spent trying to attract the microelectronics battalions. One writer insisted that international whizz-kids would go to Bristol because amenities were better there, and therefore the Lyceum is vital to Liverpool's future. I like the idea of our supertechnocrats changing their minds over where they want to live because of one building which, I understand from a colleague, is a faded Victorian clubhouse that it is painfully obvious has seen better days.

NCC seminar

WHAT PRICE PRIVACY

Wednesday, 11 April, 1979

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NCC
The National Computing Centre

A central policy is needed to cover computer education, says David Pegg, a master at Bedford School. Here he sets out several principles which should be

applied in developing such a policy, and by way of provoking argument, offers ten proposals. These proposals, he says, would cost a lot of money; but would

make the best use of the fund of expertise that already exists in schools in this country. The author is a member of the Schools Committee of the BCS.

A ten-point plan for feeding the hungry sheep...

"The hungry sheep look up and are not fed... But that two-handed engine at the door, Stands ready to smite once, and smite once more." Milton, Lycidas.

IT IS fanciful to suppose that Milton had a vision of the power of the binary computer. But the fact remains that we now have a once-for-all chance to teach people of all ages about that power and how to use it. At last the government is ready to feed the hungry sheep, with the aid of £60 million.

What proportion of this vast sum will be spent on computer education in schools is not yet clear. But how will it be spent? Will it be largely wasted, in common with many other disbursements?

Firstly, let me make clear what I understand by "computer education". It would be more exact to say "education about, and with the aid of, information technology", if it were not such a mouthful. There are three main sub-divisions: Learning how to live with the new technology; learning skills in the development and applications of devices and systems; and harnessing information technology to aid education generally.

The first applies to everyone and extends to such subjects as the use of increased leisure and the need for continued education throughout life. The second relates to the need to produce a skilled force of designers and technicians. The third is concerned with a radical reshaping of education methods.

A central policy is needed to cover the three groups. So far this has not, for a variety of reasons, emerged. Warnings were given at the 1970 IEIP Conference in Amsterdam, but they were largely unheeded. In 1971 (Computer Weekly, June 17, 1971) it was prophesied that the failure of politicians to give adequate support to computer education might well prove to be a prescription for Luddism in the 1980s.

Since then much pressure has been applied from below with very little positive action except in computer aids to learning. But the failure of politicians is only a reflection of the ignorance and dislike of computers in society. The outlook would certainly be black if there were not many teachers with plenty of experience in running courses on computers and how to use them. The growth of microelectronics has sparked off tremendous interest in schools. Many would like to have their own computer and quite a few have already bought them.

A branch of the Computer Education Group called MUSE (Minicomputer Users in Secondary Education) has expanded almost ten-fold in the last two years. Its purpose is to help schools and colleges to use small computers (minis and micros) effectively. It holds meetings throughout the country to give advice and to exchange experiences on hardware, software, teaching methods and uses of computers.

This is merely the tip of a large iceberg. In the major cities large networks have been developed, with terminals (and in some



By
**DAVID
PEGG**

advantages of decentralised organic growth against those of centralised control and co-ordination. The latter gives economy of effort, pooling of information, avoidance of repeated mistakes, economies of size and provision of the best. Decentralisation, however, encourages individualism, variety, versatility and initiative and avoids rigidity, bureaucracy and over-complication. A judicious blending of the two is therefore required.

The Open University has done remarkable work in using computers in education. Its experience could be harnessed to

computers to assist learning of proposing technology for this purpose.

4. The National Centre should be given the task of encouraging education in those aspects of the scope of the S.C. Council and the Computer Education Technology participation reference and software development.

5. The British Computer Society should monitor work, and advise the concerned when it comes to urgent action needed.

6. An advisory centre for computer education in schools should be set up, to act as a centre for information, co-ordination, and initiation of evaluation of projects.

7. A special priority is needed in the development of courses for teachers, both in colleges of further education and for in-service training. The Department of Education and Science should take an active role in this.

8. The Department should take positive steps to encourage L.E.A.s to do more on computer education, to advise them what can be done, and to assist them with funds.

Midland soon to try out cheque image processing

WHAT could turn out to be a major revolution in UK banking technology has been started by the Midland Bank, which has announced that it will begin experimental cheque image processing later this year.

Cheque image transmission networks could eliminate much of the huge cheque handling and sorting workload currently borne by UK banks.

The Midland is working with Burroughs on the project, and their co-operation should parallel fairly closely the joint development of the Bancor cheque image system in the US by NCR and the Bank of America (CW,

November 9, 1978).

Burroughs and NCR are both extremely reluctant to reveal the technical details of their respective systems, presumably because the business that could go the way of the manufacturer that produces the better system is potentially enormous.

The importance of the development to Burroughs is underlined by the fact that the Midland is dealing directly with Burroughs in the US.

A spokesman for the Midland Bank research development, in Sheffield told Computer Weekly that Burroughs and the Midland were attempting to solve the same problems as NCR and the Bank of America, and that the technologies they were using were similar. But he stressed that there was no direct contact between the two projects.

Both systems will involve some form of cheque scanner at each bank branch, and problems to be overcome in the development of both systems include

how to extract computer processable data from the graphical and pictorial information that makes up the rest of the cheque image.

Most importantly, techniques for complex sorting of cheque images will have to be perfected before the existing mechanical sorting of paper cheques can be made obsolete.

The Midland expects to install

an experimental Burroughs cheque scanning system at one of its area offices within the next six months.

One of the main aims of the experiment will be to establish how easily the equipment could be used by non-technical bank staff in a branch environment.

The system will operate in parallel with existing cheque handling procedures.

Co-operation needed

THE Midland Bank recognises that if a national cheque image clearing network is ever to become a reality all the major clearing banks will have to work together and accept standards in the way that they co-operated in the development of the magnetic ink character recognition technology currently used in mechanical cheque sorting.

The UK is likely to have a national cheque image network before the US, because the UK banking market is dominated by four large clearing banks while

the US has thousands of banks, each confined to one State and most of them very small.

The Bank of America is exceptional in that it can justify a cheque image network for clearing its own cheques because it dominates the banking business in California. It is believed to be the biggest bank in the world.

The Midland Bank also believes that it could justify a cheque image network for transmitting images between its own branches — at least in the short term.

Study of UK industry's 'failure'

FAILURE of British industry to take up new technology, specifically microprocessors, is to be the subject of a study by the Independent Policy Studies Institute. Chairman of the study steering committee is Sir Charles Carter, whose committee of inquiry into the Post Office produced the controversial Carter Report, and the institute aims to get several other eminent people to join him.

The UK is consistently less successful than its industrial competitors in incorporating

new processes in manufacturing. In the view of the institute, and this study aims to find out why, in the field of microelectronics particularly, with the objective of influencing government policy.

James Northcutt, a senior fellow at the institute, who will run the project day-to-day, describes the approach to be taken as consisting of case studies of individual firms, to discover the obstacles to change and the advantages that can accrue. Some firms that are notably successful

in modernising will be looked at, as well as some that have fallen behind.

This detailed approach is the institute's speciality, in contrast with other research bodies that concentrate on macroeconomic effects, looking at broad statistics from an economist's point of view. Several industries will be covered, but only the aspect of applications of microprocessors.

Money for the study, about £100,000 will come from charitable bodies, which the institute is now starting to canvass.

Tesco bureau offers ICL to IBM conversion service

SUPERMARKET group Tesco has set up a bureau company, Tesco Management Services, which is offering a specialised ICL to IBM conversion service. This is based on the know-how acquired while about 700 ICL programs, mainly in Cobol, have been converted for running on the group's 8 Mbyte IBM 3032.

Tesco, a prestigious ICL customer, began moving its 3032 hardware when the 3032 was installed last July, backed up by a 102,000 Mbyte 3850 mass storage system (CW, August 3, 1978).

Plans to add a 3031 to the system have been cancelled while a wide range of options is considered. DP director Barry Grange said the possible combinations included a 303X, one or more of the 4300s, or something from the expected H series due in about a year's time. Another option is to front-end the 3032 with a 4300. The final choice, says Grange, could depend on a great deal on IBM pricing policies which could be affected by the advent of the H machines.

Tesco has some detailed long-term plans including an SNA network supporting about 10,000 terminals to be installed throughout the UK during the next 10 years. Of these about 8,000 will be point-of-sale units.

Already three Computer Automation Syfa units (CW, September 28, 1978) have been

installed in depots at Milton Keynes, Crick and at the group's Chestnut HQ ready for the start of the SNA network in the late summer. A 3660 supermarket system has been installed at Wellingborough, Northants, and a 3650 PoS system at a Home 'n' Wear store in Huntingdon. Both systems are linked to the 3032 for overnight handling of data from the in-store processors.

The establishment of the bureau company is part of the group's overall plan for computer use, and in addition to the conversion service it will sell machine time on the IBM hardware and the three Tesco ICL 1904S systems as they are progressively released from in-house work as the 3032 takes over, and offer a quality printing service using two IBM 3800 laser printers. This is backed up by a forms overlay service including the production of layouts required by bureau customers.

Responsible for the bureau operation is Ian Bell who has been named business development manager and appointed an executive director of Tesco (see page 10). He told Computer Weekly that for the task of converting Tesco's programs to run on the 3032 a comprehensive range of procedures to handle each stage of conversion had been built up. These, he said, could be used not only for ICL-IBM conversion but for converting from most other makes of mainframe to IBM.

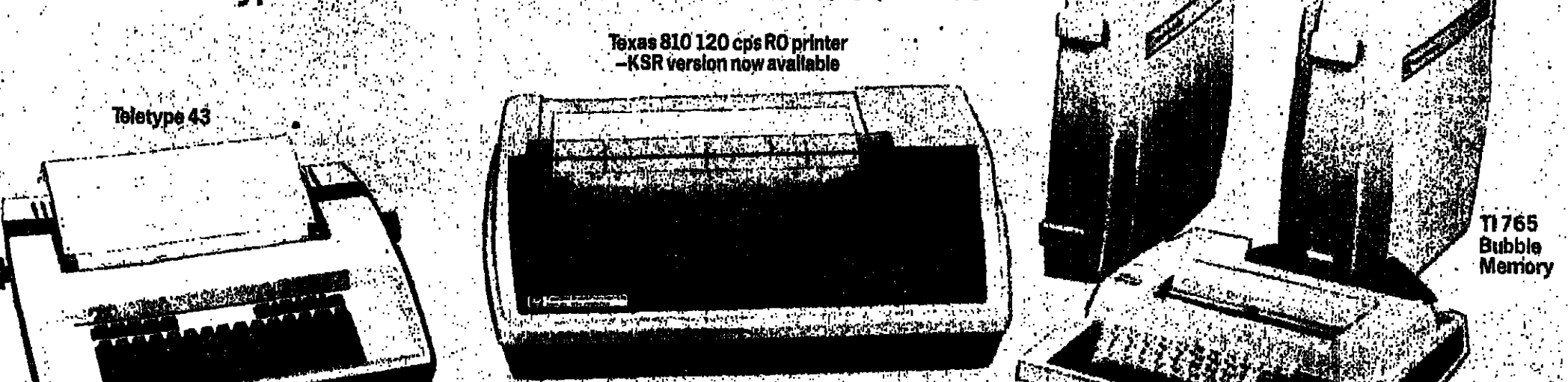
Bell said he would be recruiting staff for the bureau company and he will also be able to call on some of Tesco's 350-strong computer department to meet special needs.



Bell

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GILB'S MYTHODOLOGY

Measuring program reliability



THERE are a number of myths about computer program reliability. One of these is that you cannot predict a program failure from an unknown bug. Another is that old and well-used programs such as computer suppliers' operating systems get more reliable with age. Myths like these are usually founded on ignorance of any real measures or measuring techniques, combined with "intuition," which unfortunately has not been a good guide in this area.

Reliability can have many definitions, depending on what you expect a program to do. Let us simplify for the purposes of this column and concentrate on measurements of program unreliability which reflect failure of the algorithm to produce expected outputs, according to higher level designs or specifications.

We should establish at the outset that nobody knows how to construct a perfect program, nor how, in practice, to prove that an accidentally perfect program contains absolutely no faults for all possible inputs (including invalid ones). Readers who know otherwise should share their knowledge with a wider public immediately.

If you think you know the answer, you almost certainly have not understood the question.

The interesting question then is the degree of reliability of a program. I find that very few data processing projects take the trouble to specify the degree of reliability that they intend to build into their programs before "declaring them finished." The usual practice is to let them go on the air when the failures are at a tolerable level. This practice is dangerous because we have reason to suspect that the cost of increasing the reliability of a program goes up steeply towards infinity, when we are working with high reliability programs. It is therefore important to limit our investment in reliability to what we really need, and not get involved in a wasteful marginal return on investment in levels of reliability which cost more than they benefit any of us.

It is at this level, high quality software, that the need for measuring accuracy becomes profitable; because if we are unable to measure accurately enough, that we have reached our program reliability goals, then we are in danger of severe cost and schedule overrun as we use an "overkill" of testing or other techniques, in order to make sure we have "enough."

One method of measuring the reliability of programs that has been used by TRW Systems is to take a representative sample (see page 24 of Software Metrics (SM)) of all possible input combinations, run them all and manually audit the results. If 1,000 test cases were run and three were incorrect, we could estimate with known uncertainty that 90.7% of another thousand random inputs would also be correct.

Another method used by John Musa of Bell Labs (New Jersey) is to plot the meantime to failure of a program on a graph against the failure number (1, 2, 3 etc. from some point in time). This curve is matched against a model curve showing previous experience of the gradual lengthening of the MTTF as more errors are uncovered. In one example he showed, after about 10 errors (handled one at a time) the

MTTF had risen exponentially to about 4.5 hours. The goal was a system with at least ten hours MTTF. The points plotted thus far corresponded to the model, which included a pair of standard deviation lines on each side of the main curve model.

Using the model one could estimate that the ten hours MTTF would be reached at about the 47th failure, and using the deviation lines one was warned that the earliest we could expect was after the 43rd failure and it could occur as late as the 55th failure. Naturally, we can use this data to estimate the number of hours the system must be run before we can expect to reach our reliability goal.

Michael Fagan's Inspection method (SM, p.57) has been developed a predictive technique. The number of errors identified before testing, during inspection of source code and pseudocode, is calculated for individual modules on an error density per thousand lines of code basis. It has been shown that unusually high error density (for example 30 per 1,000 L.O.C., as opposed to 1 to 3) is an indicator of future high failure rates of a program. The program or module should probably be scrapped and rewritten by a sober programmer.

Bell Labs (EDPACS Feb. 1977, Jim Grimes) has also used file audit programs to measure program reliability indirectly in terms of errors in files. There are other methods using artificial bugs (see SM, p.34) and multiple versions of the program, to check each other. In short, there are many ways of measuring program reliability.

WHAT is thought to be the UK's first full bureau service in computer-aided design is being set up by a precision engineering firm in Birmingham. To be called CAD CAM Computers, the bureau will use the Unigraphics design system owned by the US aerospace corporation McDonnell Douglas.

The originator of the scheme, David Lloyd-Roach, of Lloyd Roach Engineering, is planning to launch the service in about six months and is currently negotiating the purchase of a turnkey Unigraphics system based on a Data General Eclipse processor.

This will be supplied by United Computing Corp, the McDonnell Douglas subsidiary which developed the software. In addition to the Eclipse, the configuration will include 8 VDUs, a CalComp 960 plotter, and other hard-copy devices.

All of this will be set up in a new office in the Birmingham area, to which customers will have to come to use the system. Lloyd-Roach is looking initially for eight client companies, each of them prepared to sign a three-year contract with the bureau. In return for a fee likely to be around £22,000 per year, they will be entitled to 36 hours computing time per week, and will also have access to the bureau's expert CAD staff.

A major attraction of the scheme is of course the chance to explore powerful CAD techniques at relatively low cost. And the fact that the facilities will not be in-house is seen as being an advantage in some cases by minimising the organisational impact.

Data links to remote terminals are still impractical for CAD, noted Lloyd-Roach, because of the very high data volumes involved. Over standard PLO lines, significant delays would arise in what should be a very fast interactive system. There were also problems, he said, with data transmission errors.

Unigraphics is already used by three organisations in Europe, including two in the UK: Baker-

SOFTWARE FILE-1

CAD bureau plans to use Unigraphics on DG Eclipse

WHAT is thought to be the UK's first full bureau service in computer-aided design is being set up by a precision engineering firm in Birmingham. To be called CAD CAM Computers, the bureau will use the Unigraphics design system owned by the US aerospace corporation McDonnell Douglas.

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Lloyd-Roach is looking initially for eight client companies, each of them prepared to sign a three-year contract with the bureau. In return for a fee likely to be around £22,000 per year, they will be entitled to 36 hours computing time per week, and will also have access to the bureau's expert CAD staff.

A major attraction of the scheme is of course the chance to explore powerful CAD techniques at relatively low cost. And the fact that the facilities will not be in-house is seen as being an advantage in some cases by minimising the organisational impact.

Data links to remote terminals are still impractical for CAD, noted Lloyd-Roach, because of the very high data volumes involved. Over standard PLO lines, significant delays would arise in what should be a very fast interactive system. There were also problems, he said, with data transmission errors.

Unigraphics is already used by three organisations in Europe, including two in the UK: Baker-

Perkins, of Peterborough, and the Royal Ordnance Factory, Cardiff. There is also a user in Sweden.

According to Lloyd-Roach, the system's accessibility to engineers was a key factor influencing his choice of it, which followed a lengthy period of investigation.

"I found that it was a tool that I as an engineer could use. As with all CAD, though, it does take time to become proficient. It can take up to about 180 hours to reach the speed previously achieved by mechanical means, but subsequently an output is possible which is four to five times that of an average draughtsman."

One of the people responsible for the introduction of CAD at Baker-Perkins will be among several expert speakers at a seminar in Birmingham later this month. An introduction to CAD generally as well as to the projected bureau service, it will be held at the Europa Lodge, West Bromwich, on March 7.

System to market Finar for financial modelling

A FURTHER prestigious customer has been found for the financial modelling system Finar with the selection of the package by Systime. Systime will supply the software to clients under an agreement with the package owners, Finar Systems Ltd, of Orpington.

Systime evaluated several similar systems for the PDP-11, according to a spokesman, eventually choosing Finar because it offered the best balance between ease of use and the range of facilities offered.

"One of the great attractions is its use of a very high level language that can be used quickly and easily by management staff. It was also one of

Planning depot location

THE optimum location of a distribution depot is the subject addressed by the latest software to be released by Delta Analysis.

Called Depot, the program interface with Delta's vehicle routing and scheduling system Trucks (Software File July 6, 1978) and, like that, are available on the CICS Services network as well as in-house use.

Among important inputs the system are road type, congestion, population density and customer site location. The factor is weighted so parameters appropriate to a user and processed up to stored information on road works.

Networks are currently available for the UK and while others including Belgium and Holland are being added, Delta Analysis, a software and transportation consultancy has developed computer programs and software for both public and private sector. It has believed to be the only company to have written software for use by the UK government's energy conservation programme.

gratuitous.

SOFTWARE FILE-2

Taking a practical view of the packages market

BOTH package suppliers and package users have come to maturity. This was the most obvious message of last Wednesday's meeting of the IDPM which strikingly ignored the clichéd advantages of application software packages, instead focusing on practical issues.

And although significant differences of opinion emerged, for example on the question of maintenance, it was possible for the chairman of the meeting, Hedley Voysey, to summarise succinctly the main thrust of the argument as a concern with total life-cycle costing.

One view persuasively put was that problems with packaged software most often arise from wrong expectations.

"Some people seem to think that you can install a package, push the button, and it will go," said Larry Levitan, of Arthur Andersen. "This is reinforced by salesmen who promise miracles, don't tell you the real cost, and don't accept responsibility if things go wrong."

"I prefer to think of packages as 'installation aids,' fitting into the normal cycle of requirements study, implementation, and maintenance. It's essential to remember that the software is just one component in the total system."

Levitan emphasised this point in a discussion on selecting a package.

"You don't simply call in all the vendors. The correct first step is to define your requirements by identifying very specifically what you want from the system."

Only then, he said, was it possible to evaluate the usefulness of a package properly.

The need for modifications was almost inevitable, he suggested, noting that he had never participated in installing a package without modifications.

On the subject of maintenance following the implementation, it was his view that the customer himself should be capable of maintaining the software — one common failing in package use being insufficient involvement of the user client.

A rather different aspect was emphasised by a subsequent speaker, who argued that a package was more than "a set of programs that someone is prepared to sell."

"A package is intrinsically conceived and designed with the idea of installing it in many installations," noted Vince Wells, of RTZ Computer Services. "It should be possible to modify its performance via parameters, rather than via coding alterations."

It was precisely the built-in flexibility of a package, he suggested, that could lead to savings in the cost of system ownership.

"For obvious economic reasons, an in-house system is not generally developed with the flexibility of a package. Yet the requirements for change in an in-house system are exactly the same as those already catered for in a package."

"The result is that, of the two, the package has a longer life and is less costly to maintain."

Packaged software was also more reliable and better documented than the typical in-house development.

The value of application packages to the first time user

was the main theme of the third speaker, Ron Burrell of Zeus-Hermes.

"Whether on their own machine or on a bureau, a package enables a first-time user to get his feet wet. He can confront all the usual implementation and organisational problems without getting involved in writing software."

While this was generally agreed to by the panel, it was noted by Levitan that it could lead to the phenomenon of the "second-time user."

"He bought that thing and it sure looked great. Nobody told him though that it didn't calculate sales commission — or whatever. In this, as in other cases, if you don't know the environment, you're going to get burnt."

"Software packages are one of the last good examples of free

IT is exactly ten years since Software File first appeared. And although there have been many significant developments over the last decade, no one could deny that one of the most striking has been the continued strong growth of the packaged software market.

It was the enormous potential still projected for this market that was the main reason for the establishment of the NEB's software venture two years ago. And since then, an even more voracious demand for software has stemmed from the exploding small business systems sector.

In addition, a substantial and rapidly growing market has opened up with the advent of ultra low-cost microprocessors and microcomputers.

With these trends in mind, Software File looks this week at software packages, with a report on last week's meeting of the Institute of Data Processing Management. The IDPM called its meeting "A software packaged future: are we getting value for money?"

enterprise. It's relatively unregulated by the government, it's easy to enter the marketplace, and pricing is largely by supply and demand. Good products can be very successful, while if products get a bad name, they don't sell.

"It's up to the buyer to beware." Echoing this warning, none of those speaking reacted strongly to the suggestion from the floor that packages could be a "soft" way into software business generally.

"Packages have a way of turning themselves into bespoke systems," commented one of those attending. "The supplier then charges for modifying it as a turnkey system."

With this caveat, most of those attending felt that the value offered by packages was now compelling, and in one case at least — that of the payroll — was irresistible.

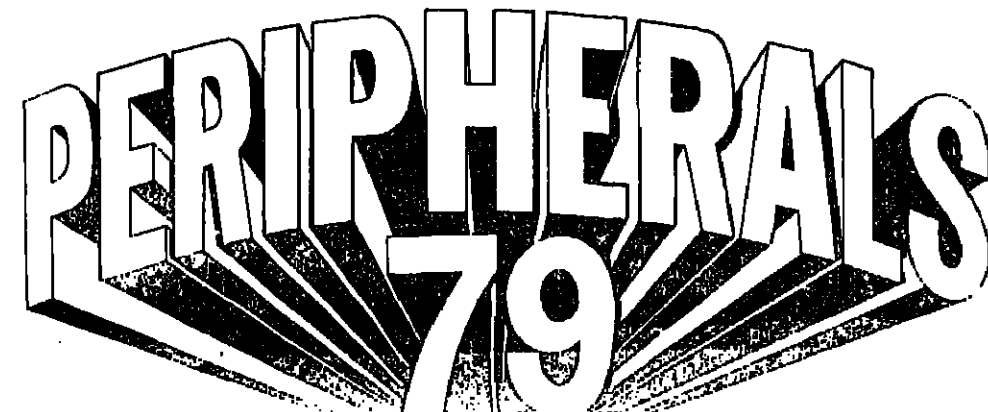
Zeus divides six ways

ALSO celebrating its tenth birthday (see panel left) is Zeus-Hermes, which has marked the occasion with a radical internal re-organisation.

This has created six independent operating companies under the wing of a holding company called Zeus-Hermes Investments. Aim of the move is to preserve the "small company" advantages up to now enjoyed by the firm, which last year grew to a staff level of 115 and a turnover in excess of £1 million.

The company's traditional real time activities, together with growing microprocessor work, will be taken over by Zeus-Hermes Ltd.

Provision of turnkey systems, such as the accountant's system Pack, will be handled by Zeus-Hermes Computers, while commercial DP services, including the TP monitors Cortex and Cadiz, will be the responsibility of Zeus-Hermes Management Systems.



ORGANISED BY THE PERIPHERAL SUPPLIERS ASSOCIATION

WEST CENTRE HOTEL - LONDON

You are invited to a new and exciting event in the Exhibition Calendar. Following the highly successful launch of PERIPHERALS 78 at the Kensington Close Hotel last year, the Peripheral Suppliers Association (PSA) has moved the 1979 Show to a larger and more appropriate venue — the Richmond Exhibition Suite at the West Centre Hotel in London.

PERIPHERALS 79 will gather together the very best in computer peripherals from renowned manufacturers throughout the world. Most of the United Kingdom's leading suppliers will be exhibiting at the Show and include:

S E Labs (EMI) — Geveke Electronics — Cifer Systems — Lynwood Scientific — Sintrom Electronics — Technitron — Euro Electronic Instruments — ITT Modular Instrumentation — Pragma — Penny & Giles — Kode — Trend Communications — Versatec Electronics — Data Dynamics — Data Design Techniques — Electrographic Audio Visual.

Many completely new products will be on display including the very latest in:

Floppy Disc Systems — Visual Display Units — Digital Plotters — Cartridge Memory Systems — Serial Page Printers — High/Medium Speed Line Printers — Printing Terminals — Electrostatic Printers/Plotters — Modems — Micro-based Terminals.

PERIPHERALS 79 will take place on 13th and 14th March and the opening hours are from 10 a.m. to 6 p.m. on the 13th and from 10 a.m. to 6 p.m. on the 14th. Entry is free by ticket (obtainable from the exhibitors or from the organisers). Tickets will also be available from the reception desk at the Exhibition on production of the completed form below.

The West Centre Hotel is situated in Little Road, London SW8 1UQ. The A4/M4 passes close to the Hotel and West Brompton and Earl's Court underground stations are in close proximity. Buses 30, 74 and 748 pass the Hotel to and from Hyde Park Corner.

PERIPHERALS 79 is Sponsored by the Peripheral Suppliers Association. Additional information is available from: The Organisers, PERIPHERALS 79, Owles Hall, Buntingford, Herts. Tel: Royston (0763) 71209

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Atkins buys Oxsys building system

TO reinforce its services in computer-aided design, W. S. Atkins has bought the Oxsys building system developed by Applied Research of Cambridge.

Flexible Easytrieve

FURTHER flexibility in I/O handling is the main feature of the latest release of Pansophic's Easytrieve, Version 8.

Among intrinsic enhancements are facilities for dynamic positioning within ISAM or VSAM files and greater control over record selection. Users can now handle character strings longer than 256 and variable length data fields with a single command.

Also announced was the first Easytrieve selectable unit, USIO, which makes it possible to access an unlimited number of sequential input or output files in a single Easytrieve job.

Sales and support in the Midlands, the North and Ireland are now being handled by a new Pansophic office in Manchester. A regional centre reporting to the London headquarters, it is located at Alpha House, Wythenshawe, Tel: (061) 436 1415.

It will run the software on a newly-installed 256K Prime 300 system, which will be devoted entirely to building design work.

Oxsys is particularly well suited to projects making substantial use of standardised and modular components and is able to take on many of the more technical tasks, such as repetitive drawing and quantity estimating.

The Pru chooses Adabas

THE massive Prudential Assurance Company has chosen Adabas to handle its DBMS applications, following two years of evaluation and performance trials. It plans to use it first on Ordinary Life assurance, processing around 3 million policy records both in batch and online.

A particular attraction of the system for the Prudential is understood to have been data

A prime application is in rapidly comparing the cost of alternative schemes.

Atkins will use the system first in connection with a new university complex at Tlemcen, Western Algeria, for which it has an eight-year consultancy contract not only to design the building complex, but also to supervise its construction.

Mini LP adapted for DG use

ORIGINALLY developed for the Digital Equipment PDP-11, Solcon's minicomputer linear programming package Mini LP has been adapted for use on Data General systems.

One of the first applications of the new software has been the development of an animal feed system for Solcon's parent, BP. Installed at BP Nutrition's works in Northwich, Cheshire, it will be used to provide a feed formulation service to clients.

very few packages for completely conversational use.

The software will be ported on Systime Series and larger configurations will run concurrently with other software. It is priced at £6,000 including training, documentation and will be available for 30 days on trial.

Finar is already installed around 30 sites in the UK and has many users in the US.

Among seven sharing bureaux offering systems is Solcon, which has the software last year after working it for use on its own machines (Software File 15, 1978).

An active user group has held two annual meetings and is one focus for continued user-requested enhancements to the package, currently running as version 3.4.

MMS system worth £3/4 million

INCOME of over £1m from the MMS general and financial reporting and financial reporting package helped Package Programmers achieve a turnover of over £1 million for the first time — a growth of more than third.

Latest assignments include two contracts in the UK and one in the Costa Rica. The package will run on the IBM 370 system.

See page 10

What's your line?

Please tick in the appropriate box ☒

TIME SHARING BUREAUX who do not wish to take financial and technical responsibility for terminals acquired by clients.

COMMERCIAL BUREAUX moving into the remote job entry and telecommunication market.

MANUFACTURERS OF TERMINALS and their agents, who wish to avoid the capital commitments that offering their own rental service entails.

LARGE COMPANIES with a potential telecommunication network, which could involve high capital expenditure on multiple terminals.

ORGANISATIONS such as educational establishments who commonly have revenue budgets rather than capital budgets.

MINI COMPUTER USERS who wish to limit their capital expenditure.

USERS OF WORD PROCESSING SYSTEMS who may not wish to make a capital commitment in a system area that is rapidly changing.

If you can identify with any of the above you should be speaking to our specialists who are qualified to advise, study and recommend according to your needs.

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OP SPOT

THE manner in which a person dresses will, in the long-term, affect his attitude towards work. Thus, an operator who dresses in an over-casual or sloppy manner, will come to approach his operating in a similar way.

That view was put to me by a manager. It's an interesting thought, because at some sites the operators are allowed to please themselves, more or less, with regard to dress, while at others they are instructed to wear suit, collar and tie, and on no account to dress casually.

Contributing to this odd state of affairs is the fact that the computer room is a hybrid environment; it is neither office nor workshop, but a mixture of the two. At one moment the operator might be sitting at the console, dealing with a stream of system messages, and the next mounting a tape or disc, loading stationery on the printer or even cleaning that device.

So what sort of dress is right for the operator? In my view, the answer is smart but practical; comfortable but safe.

Games operators play can be of benefit

WHILE at the West London installation of Marks and Spencer, I noticed a darts board and backgammon set in the operators' rather plush rest room.

One of the operators told me that both games are quite popular with the operations staff as they can be completed within half an hour and so are ideal for coffee breaks.

In my view, such pastimes are important as they take the operators' minds off the workings and problems of the computer room and thereby help them to relax during breaks.

At one installation I know, quite a sizeable card school grew up. After a time several of the operators started playing for money and on one occasion one of them won £20 during a half-hour break.

And you could always tell which of the lads had come out on top during a card-playing session — he would be the one who returned to the computer room grinning like a Cheshire cat.

Table tennis is another game popular among operations staff. At an installation where I once worked we used to play doubles.

Table or bar football is another good game. It's just right for coffee breaks. At an installation where I once worked, we

Do careless dressers make sloppy workers?

dress to safety, but in the context of the computer room it is an important consideration. Card readers, for example, are capable of digesting unusual forms of input, such as ties and long hair.

On one occasion, a friend of mine, an electrician, was working in the computer room when a girl's hair was dragged into a reader as she was inputting some cards to the device. Fortunately, he had the presence of mind to press the stop button and so prevented a serious accident. Nevertheless, her hair had to be cut, and she was taken to a local hairdresser who finished the job.

Safety factors aside, managers

should remember that operators have to perform some rather dirty tasks during the course of their duties. Working the printers is the best example. It is usually the responsibility of the poor old trainee, who has to hump dusty boxes of stationery about, exchange ribbons and clean the devices in addition to responding to system requests for paper changes.

Some sites provide the operators with dust jackets, to be worn as they operate the printers. At installations where that is not the case, the management should think again or, alternatively, award the staff an allowance to cover extra cleaning bills.

But I must take up my manager friend on his view that over-casual dress has an adverse effect on attitude. In my experience, that is not always the

case. An operator I once worked with was noted by his colleagues for his ability to sort out system problems, and not for his appearance or attitude. Many a time he would solve a problem in the computer room — and thereby prevent an additional IPL, or system load — after all the so-called experts had failed.

To me, that example is a sad reflection on the fact that, at

many installations, the management places greater emphasis on appearance than technical ability when considering promotions.

At some sites, the operators are expected to wear suits because they often get visits from members of other departments within the company. Fair enough, I suppose, but if that is the case the operators should at least be allowed to please them-

selves on the evening shifts.

Banks are notorious for collar and tie image — operators are expected to conform regardless of the shift. At one such site an operator turned up for his shift dressed in blazer, trousers but instead of a tie he wore a string of brightly-colored beads. The manager was time in telling him just what bank expects from employees.

By way of contrast, operators at university sites do not such interference in management. They are allowed to please themselves in regard and it goes a long way towards creating a maintaining the atmosphere which prevails such installations.

By Bernard Allen

On VDUs as a health hazard

OVER the past few weeks I have received a number of enquiries from persons wishing to learn more about two recent publications on the health hazards facing VDU operators.

The first, called Eye Tests for VDU Operators, is from the VDU Eye Test Advisory Group (Op Spot, February 1). It is a discussion document in which the group proposes a battery of eye tests for VDU operators.

For further information, contact Toim Stewart, VET

Advisory Group, c/o the Department of Human Sciences, University of Technology, Loughborough, Leicestershire LE11 3TU.

The second paper is entitled Visual Display Units: Nightmare to the Operator? by the Occupational Health Committee of the Association of Optical Practitioners (February 8). For further information contact Joan Stanton, Public Relations, 27a Sloane Square, London SW1A 1JL. Tel: 01-730 8273.

Are you still locked in by that micro chip bargain you bought a year ago?



You thought you were saving money. And ever since you've been losing time, time, time...

HINT OF THE WEEK

OS Modify helps keep track of punched output

MANY of the hints which have appeared in this column concern the use of operating system facilities to save the operator a lot of unnecessary effort.

This week's offering also falls into that category. The subject is the IBM OS Modify command which may be used to good effect in relation to punched output.

After a Writer procedure has been started to a punch unit, it will select jobs from output queue B, the accepted norm for punched output, and transfer it to the assigned device.

And as the Writer selects each job from the output queue, the system sends the operator a message including the address, or identifier, of the punch device and the time the job was output. The operator may then

remove the output from the device at his leisure.

This all works fine until, say, half a dozen jobs are punched in quick succession on the same device. Then the operator wastes a lot of time "spitting" the output, for, unlike printed listings, punched output has no header and trailer label preceding and following each job.

By using the Modify command, the operator can instruct the Writer to pause after it has caused a job to be punched. The command has the following format:

F xxx, Pause = Datagat

In practice, it is often best that the main console operator remains at his station and deals with the system messages, while one of his colleagues actually removes the punched output from the unit.

We welcome your views

OPERATORS often complain that nobody listens to their point of view. Well, Op Spot is listening and Bernard Allen would like to hear your opinions and ideas on all matters relating to computer operations.

Your letters should be sent to Op Spot, Computer Weekly, Dorset House, Stamford Street, London SE1 8LU. Telephone calls are equally welcome and Bernard can be contacted directly on 01-261 8035.

NEWS IN BRIEF

Nixdorf plans in Ireland

PROBLEMS over building costs for a Nixdorf plant in Dublin have now been resolved, and the West German small systems company is planning production in Ireland later this year.

Nixdorf wanted a factory built to the same specification as a new plant at its Paderborn headquarters, and misunderstandings between the company and the Irish contractors made it appear that the Dublin plant would cost considerably more per square foot than the German one (CW, October 20, 1977).

Moscow scores

THE two "unidentified IBM machines" which will do the actual scoring at the Moscow Olympics prior to the information being disseminated by two ICL 2904s (CW, February 22), are 370/148s.

First outlet

FRANCHISING, long established in the fast food market, has reached the personal computer business and the first European outlet of a US franchise chain called Computer Land has opened in Brussels.

Powerful processor

THE new IBM 3880 disc controller introduced with the IBM 4341 (CW, February 8), is a powerful processor which could be programmed as a back-end database system.

This has emerged from additional details revealed by IBM, which now says that the 3880 is based on a five million instruction per second eight-bit data word micro which uses 16-bit micro-instructions. The micro is an ECL

bipolar device which uses the same basic technology as the processor chips, and is made from a 1400-gate master slice. IBM says that because of its specialised control application, the instruction set consists principally of branch and register-oriented instructions.

The intrinsic power of the device leads observers to believe that the 3880 could form the basis of a back-end database,

Nascom 1 microcomputer kit price reduced

THE price of a Nascom 1 Z80-based microcomputer kit has dropped from £187.50 to £165, and the long-awaited Zeap editor and assembler program which runs on it is now in the shops.

The price cut for the kits was meant to coincide with the availability of ready-made boards at £210, but these have been delayed by shortage of chips including 74LS163 binary counters and 81LS87 buffer chips.

Sales director Kerr Borland said, "We've barely had enough of these chips for the kits we are sending out. The ready-made boards will double demand because many people, schools in

particular, want to do software but not soldering. We had hoped to have started building ready-made Nascoms by February 14, but now it will be the middle of March."

Zeap, the 3K byte assembler program written for Nascom by Paul Chapman and Geoffrey Roughton of Sigma Accounting and Management Services and announced at the PCW Show last year, has finally made it into dealers' shops.

Costing £32 on cassette it runs in Nascom with expanded memory, as do Tiny Basic and Super Tiny Basic which became available at the same time as the memory expansion kits in January.

CSA GOES INTO WORD PROCESSING TRAINING, AND INTERNATIONAL ISSUES

Dol orders office automation study



DIANA DUGGAN... "spreading the gospel about word processing."

TO promote awareness and understanding of office automation among potential users in industry, a consortium of consultancy firms has been commissioned by the Department of Industry to carry out a three-phase study project.

Operating under the umbrella of the Computing Services Association, the project additionally aims to see that more text processing consultants are trained for the future, and that the difficulties users encountered in bringing in data processing are not repeated with office systems.

The five firms are Arthur Andersen, Langton Information Systems, Logica VTS, Peat Marwick Mitchell, and P-E Consulting Group.

Phase One will cost £40,000 and will consist of R&D by the

cost and the Department of Industry will pay the other.

From these studies should come a better idea of what offices should be like in the 80s. The designs of applications that are developed will be fed back to word processing manufacturers to help them in their product planning. Moreover, a wider field than just word processing will be considered.

Facsimile, COM, Teletex (CW, February 22), Prestel, and electronic mail will also come in.

Heading the project is Colin Lesson of Langtons, and Diana Duggan, of Logica VTS, is technical leader. She describes the basic idea as "spreading the gospel" about word processing among potential user organisations, both to improve the efficiency of UK industry and also to promote our own office systems manufacturing sector.

She also hopes it will help to avoid "the horror people went through with the introduction of computing." In addition she says there should be a great deal of interesting data coming out of the studies, to do with how firms' communications work at present, how much of their mail is internal and how much external, and so forth. Training of new consultants is also very important.

Education division set up to develop training policy

SHORTAGE of computer staff, particularly among service firms which are currently looking for 3,000 people, has prompted the CSA to establish a new division for education and training, and to appoint a full-time training officer.

The division's first tasks will be to develop a training policy and schemes for computer-aided training, and to talk to government departments, universities and polytechnics about the industry's needs.

Alan Thomas of Data Logic says the UK has a particular problem in this area, with a "haphazard system" of training which does not go well with our rapidly changing industry, and a "gap in understanding" between industry and the education system.

For instance, he says, many university staff still think that engineering training is necessary for careers in computing, while recent studies have shown that arts people perform just as well in the services industry as science people.

Alan Benjamin, CSA director-general, adds that the idea of conversion courses for people with experience in other fields is "totally neglected," and this is

an important area that the CSA must promote. Submissions are to be made to the Manpower Services Commission on plans for courses of high practical content, he said. The Training Division will also carry out a research project into the contentious question of DP aptitude tests.

On the international front, the CSA is starting a dialogue with its counterpart associations in Europe, the US, Canada, and Japan on important matters of common concern such as national information policy, government regulation, unfair competition, Customs duties on data, and cross-border data flow. The question of software copyright is also being dealt with; the CSA is to hold a one-day seminar on this in June.

There is a proposal that European countries levy a tariff on magnetic tapes according to the value of the information content, and the CSA is concerned about the effect this could have on business, and about the difficulty there would be in assessing such value.

Plans are also being drawn up for the Second World Computing Services Industry Congress, to be held in San Francisco in June 1980.

Into battle — by computer

AS a result of recent battle simulations, the British Army's Battle Group practical training session at Bovington is to continue developing the use of computers in training troops.

Using an Olivetti P8080, the group has been putting regiments such as the Grenadier Guards and Royal Fusiliers through their paces and, according to an Army spokesman, "left our customers have been impressed."

"The whole exercise is done indoors, at Bovington," said the spokesman, "and it is a brand new concept. Normally, such battle simulations are done with the real thing out on the field."

At present the Olivetti system only produces "mathematical" simulations in real time, but there are plans to move to a larger computer and install graphic screens to keep track of the "battle."

Call Digital Equipment. We can set you free.

In the reasonably simple world of small programs — say, 512 words — price is still a pretty good criterion. But once you're up in the 4K/8K numbers, there are a lot more important questions to ask.

Like time — how long between idea and product? Buy a low-cost micro chip now and you may still be looking at it in 18 months — and losing money hand over fist.

While a Digital micro — LSI-11 board or PDP-11/03 box — can be working for you in a fraction of the time.

And your finished product will be out there earning money for you while you get busy on other new ideas.

If you really want to substantially cut your time between idea and product, you'll be smart to check our packaged versions. They're the ideal way to speed things up.

This is not to say that they're cheaper than micro chip bargains. No way. You pay for what you get.

But you'll save significantly on development costs.

And you'll probably save about six to twelve months of your life.

Digital micros are designed to be very simple and easy to interface with — either general purpose interfaces or your own easy-to-implement design. And they also team up easily with much of the software and systems wardrobe of the Digital PDP-11 computer family.

Random access floppy disk systems, powerful real time systems — RT-11, Industry standard peripherals — DECwriter printers and video terminals.

Languages like FORTRAN IV (scientific, engineering) or BASIC (conversational) as option.

The board PDP-11/03 is the size of a stereo receiver. It comes with 8 KB (RAM, ROM or CORE) and can expand to 66 KB.

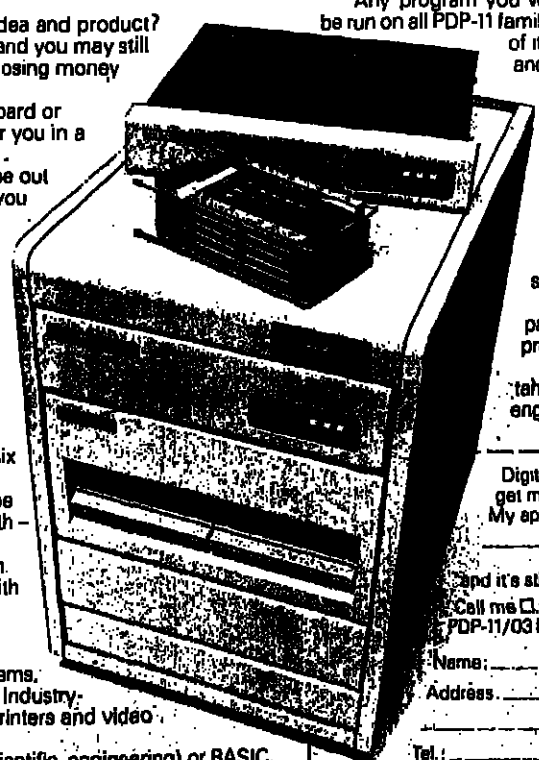
It's as at home in the laboratory as it is in shop or office. And it belongs to a family that's as much at home working the smallest machine tool as it is when running a railway system! Any program you write for your Digital microcomputer can be run on all PDP-11 family minicomputers. And this is an indication of its almost unlimited upward expandability and the considerable savings you can make in upgrades.

Upgrading your micro chip could cost you a lot more than you bargained for, especially in reprogramming and redesign; whereas a Digital system will probably cost you not much more than the upgrade equipment alone — and certainly get you back into business faster.

If you're just thinking of computerising, start with a call to Digital.

If you're looking hard at a cobbled, patched, tinkered, still half-finished micro project... call Digital!

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Digital Equipment Co. Limited

MICRO NEWS SPECIAL

IF European governments fail to extend their current policies towards microelectronics to include the wider aspects of the use and development of information technology, some of the "horrific scenarios" of the impact of technology on employment could come to pass.

That is the view of IAN MACKINTOSH, whose company, Mackintosh Consultants, has an enviable track record over many years for projecting the impact and development of electronics and information technology. Mackintosh has played a significant role behind the scenes

in influencing policies throughout Europe, particularly towards supporting growth in microelectronics and related industries.

Although he applauds the UK government's lately acquired awareness of the importance of micros, he believes this is merely a case of catching up with the last

decade and that the future now lies in the convergence of computing, telecomms and microelectronics into an integrated information technology.

In this exclusive interview with Martin Banks, Dr Mackintosh enlarges on his views on the development of IT.

The UK needs an Institute of Technological Planning

COUNTRIES and companies should be looking at how to exploit the services and products that are now possible by combining computers, telecommunications and micros. Emphasising this, Dr Ian Mackintosh points to the "automated office", and new media markets, using video discs and integrated video/computer terminals, as

examples of areas for development.

Information technology, however, is a complex area, without the sudden simple and cataclysmic impact of some other more clearly defined technological breakthroughs. Mackintosh believes that there is a strong argument for establishing an Institute of Techno-

logical Planning in the UK and possibly elsewhere to provide a more coherent framework to replace the current "random" opinion-forming process.

This proposal is different from that of Inmos director Iann Barron who has, in the past, proposed the establishment of a Minister of Information Technology. Mackintosh's Planning Institute would be an informed advisory body rather than an executive arm of government.

Mackintosh emphasises the importance of such a body when he points out that, although he remains optimistic that in the long run information technology will enhance human activities, "The next 20 years will be tough while people come to terms with technology."

He points to Japan, which has had a coherent approach to information technology for a decade, as an example of the number of new jobs that can be created, given foresight.

"Harnessing technology is now the great challenge", he says, suggesting that while the recent glut of government support for microelectronics manufacturing and microprocessor applications provided the right basic ingredients for the future development of UK industry, it was now very important that the government should turn its attention to the markets that will provide the necessary synergy for the semiconductor industry.

Mackintosh has been in the semiconductor industry since 1953 and was one of the earliest members of the brain drain when he went to Bell Laboratories in the US in 1956. By 1961 he was head of the Westinghouse microelectronics research division in the US.

By 1964 he returned to become managing director of Elliott Automation Microelectronics, a new operation that for a while put UK expertise on a par with US manufacturers.

Among other milestones in his career, he was responsible at Elliott for the establishment of what was, to the best of his knowledge, the first significant MOS research facility in the world.

His career in the "front line" of semiconductor ended when the Elliott Automation group was taken over by English Electric, which already owned Marconi. This latter company had a new, large semiconductor plant at Witham in Essex. Elliott's plant in Scotland was closed down.

Having found that locating venture capital in the UK was next to impossible once that the word semiconductor was mentioned, and following an unsuccessful attempt to start his own IC company, Mackintosh set up shop as a consultant specialising in this growing industry.

He now employs about 70 full-time in the UK, Germany and the US, and the company has developed an extensive database of five year rolling forecasts that cover not only semiconductor, but all areas of electronic use and application.

Mackintosh acknowledges that any Information Technology Planning Institute that might be established would face considerable problems. One of these would be credibility, because it might be part of the public sector and could therefore risk becoming somewhat removed from reality by losing direct contact with market forces.

It should not consist of the actual decision makers. "Rather, it should be a sharp-end think tank, and therefore it should lose its job if it gets things wrong, just like any consultancy."

"Information technology is certainly at least as significant as the development of the transistor and integrated circuit. The

Department of Industry, that systems such as word processors would decimate office employment (CW, October 5, 1978). "Just look at the fantastic prospects for electronic mail systems based on communicating word processors."

He is also sceptical about some suggestions that the micro could be the root cause of political unrest. "I have been aware since I was at Elliotts that technology, properly used, was a means to economic, and therefore social and political, stability."

The activities of the UK, French and West German governments over the past year in suddenly waking up to microelectronics and the microprocessor have been of particular interest to Mackintosh.



MACKINTOSH
... the next 20 years will be tough while people come to terms with technology

only difference is that it is not as cataclysmic; it is more an evolutionary step."

One of the aims of a planning institute would be to encourage the development of entire industries that would be based on or make use of information technology. That, he felt, would then naturally provide the market-place for the now well-supported microelectronics industry.

Such industries include the obvious selection of consumer systems, telecommunications and office products, though Mackintosh finds a growing difficulty in drawing lines of distinction between some of them. "Telecommunications, office products and computers, for example, are becoming so inter-related they are almost a technological continuum, and this will be the industry of the future."

A government attitude that followed these lines could do much that was positive in terms of future employment, Mackintosh felt.

In particular, he disagreed with the suggestions put forward by the Science Policy Research Unit, in a report for the

His company has been directly involved in stirring up the hornets' nest of the past 12 months, having been asked in 1978 by the West Germans to produce a study on the state of the West German semiconductor industry.

This soon became a multi-client study, as the West Germans were keen to see a co-ordinated European posture. The UK, France, Holland and the European Commission joined in.

Mackintosh and his staff studied the technology, markets and strategy, aiming to define the ingredients of success. One of the early conclusions was that government support, to at least the same level as the Japanese, was essential to succeed.

The study pointed to the reasons behind the success of the US semiconductor industry, which stemmed from the coincidental emergence of the space industry, the growth of the computer industry, and the burgeoning of the new silicon technology to serve their needs.

Though the same ingredients prevailed in the UK at the same time, the US had one fundamental advantage — far larger mar-

kets that gave the essential economies of scale for profitable semiconductor manufacture.

By 1977, the study was finished, and the West German went promptly into action. Siemens bought US semiconductor manufacturer, Litronix, and a minority stake in AMD. Philips in Holland had already bought Signetics.

In the UK, things moved more slowly, and it was the end of 1977 before the first whiff of government activity was heard.

Two particular market areas the study highlighted were: consumer electronics and telecommunications. Both offer considerable potential for a European semiconductor industry to interact with, and in the case of telecommunications is largely protected market. This came European companies' view of competition.

In the end, no co-ordinated European posture developed, which Mackintosh regrets. He believes there are some virtues to pan-European operations, he said, and insists that the three principal players are going separate ways. It is now clear if the market can't support all of them, for they can't all be in all product areas. Notwithstanding his views on what the UK government should be doing, Mackintosh is delighted with the activity so far, especially in the support for applications as well as semiconductor manufacture. He does, however, add that it all should have been done eight years ago, something he suggested at the time.

He also has reservations about the government's Mapcon project, especially the £2,000 subsidy for application feasibility studies. "A reasonable study is going to cost at least £10,000, though £2,000 is a move in the right direction."

On the much publicised formation of the NEB-backed Inmos, Mackintosh is also pleased with the developments so far.

Though at pains to dismantle the "popular fallacy" that there are some corporate connections between Mackintosh, Connes and Inmos, one of whose partners, Iann Barron, is the president of Microcomputer Associates, Mackintosh publicised his view that there was merit in the existence of "British Semiconductor Manufacturers Ltd", with a public sector funding.

The only Mackintosh connection with the Inmos controversy came at the very beginning when the company was commissioned by the NEB to write a proposal, put to it by Dick Petritz, now Inmos' chairman. The conclusion reached was that the probability of success was high.

Mackintosh claims to have been one of the few people to be consistently right in doing the UK should not have semiconductor industry. Many people will agree that if he is right, it is

MICRO NEWS

Conflict of interest behind AMC split

ADVANCED Micro Devices Inc and Siemens AG of West Germany have agreed to split up their joint venture company Advanced Micro Computers formed about 18 months ago (CW, October 13, 1977). The decision to split was made in an effort to avoid a conflict of interest between the Z8000 and the 8086.

AMC is 60% owned by Siemens and 40% by AMD and under the agreement AMD will buy out Siemens' US interest in AMC and Siemens will buy out AMD's interest in the venture in West Germany.

At the time AMC was formed, Siemens also agreed to buy a 17% stake in AMD, becoming AMD's largest single shareholder. The agreement also meant that Siemens was represented on the board of AMD.

A statement issued by both Siemens and AMD stated that the restructuring was appropriate in view of the different marketing objectives of the two companies in some areas of their respective microcomputer activities.

When plans were first revealed for the joint venture it was seen as a means of sharing expertise in development work for microcomputer systems, systems components, and software products. Early products were expected to be based on 8080 processor devices (CW, November 24, 1977). At the time both companies held Intel second source agreements.

In August 1978 AMD signed a technical exchange and cross-licensing agreement with Zilog which enabled AMD to be an alternative Z8000 supplier. AMD is believed to be developing certain peripheral circuits with Zilog.

Earlier in the year AMC was manufacturing and marketing AMD's System 29 MPU development system and a series of 8080-based boards formerly produced by Siemens. It is believed that these two product lines were entirely transferred to AMC, the boards marketed from West Germany and the systems from the US.

It is thought that a new second source agreement between Siemens and Intel is imminent in which Siemens will have access to 8086 masks. Siemens will also develop peripheral circuits for the 8086.

The group, Micus for short, is aimed at small businesses, departments of large companies and professional practices, such as accountants and architects, who plan to use or are using microcomputers. The initiative has been taken by the Institute of Data Processing Management

A NEW training course on the TI 9900 range of microprocessors is offered by Blesdale Computer Systems Ltd. The training given is designed to provide the participants with a good understanding of the design and development of micro-based systems.

The hardware has been designed to enable systems to be built similar to those the attendees will be building on leaving the course. Instruction covers the aspects of software design and development necessary to control the operation of the hardware.

The courses are backed by the Department of Industry. For further details contact: Course Registrar, Blesdale Computer Systems Ltd, 7 Church Path, Merton Park, London SW19.



Motorola's Euro marketing move

DEDEDY SABAN (left) has been appointed marketing director of Motorola Semiconductors in Europe, based in Geneva. Saban first joined the company in 1962 as export sales manager. In 1968 he moved to Fairchild as director of in-

ternational planning and in 1970 he joined ITT Semiconductors as vice-president and worldwide director of marketing. Before rejoining Motorola in 1977 Saban held key posts with Cramer Electronics and Solid State Scientific.

CW's micro show bigger in 1980

VISITORS from about 30 countries went to Microsystems 78, the second annual exhibition and conference aimed at bridging the technical gap between the makers and users of microelectronics (CW, February 6, 1979).

The 3,856 visitors represented a wide range of industry and professions, including accountancy, distribution, all types of engineering, manufacturing industry, transport and wholesaling.

This successful series will be continued in 1980 when it moves to the larger Wembley Conference Centre, London. Microsystems 80 will be held from January 30 to February 1, 1980. The Microsystems series is organised by IPC subsidiary (IIFE Promotions of Dorset House, Stamford Street, London, SE1 8LU. It is sponsored by several IPC Business Press journals including Computer Weekly.

Off the peg

TEXT formatting software is now available ex-stock from Memec Systems to run on Zilog MCZ Systems. Text entered in unformatted form with embedded control characters produces paginated text. Several options can be selected by the operator, including page numbering.

Intel single board computer

A POWERFUL single board computer based on the 8086 CPU has been introduced by Intel. Called the ISBC 86/12, the board is claimed to be a replacement for four standard minicomputer boards in a typical OEM system at about half the cost.

The ISBC 86/12 comprises 16-

bit 8086 CPU (up to 48K bytes of memory), dedicated parallel I/O, and a serial communications interface. It is plug-compatible with the standard Intel Multibus and can be expanded using any ISBC expansion card, such as RAMs up to 64K bytes.

The boards are available from GEC Semiconductors.

Exchange clubs urged

CLUBS should be formed under the aegis of research associations to encourage the exchange of information between companies for their mutual benefit in the application of microelectronics.

This action was urged by Leslie Huxford, MP (Lab, Nuneaton), a Parliamentary Under-

Secretary of State at the Department of Industry, at a luncheon held under the auspices of the Committee of Directors of Research Associations.

Representatives of senior management from the engineering industry attended the luncheon, the first of a series

Flight simulation contract

MICRO Consultants have been awarded a contract by Westland Helicopters to supply 10 Intellect picture generation and processing systems. They are to be used in the simulation of avionic systems during the design and

manufacture of the Wt 34 helicopter, the planned replacement for the Royal Navy's Sea King.

It will also supply software for the generation of complex synthetic displays.

\$4.5m wafer plant expansion

INCREASING worldwide demand for more complex silicon epitaxial wafers has led to a planned \$4.5 million expansion in Cincinnati Milacron's manufacturing plant in Ohio.

US. The plant, to be completed in 1980, will increase capacity for the production of wafers. Some of the investment will be in the development of specialised production equipment.

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THE first real test of the government's reluctance to breach its own pay guidelines and comply with the results of a pay survey showing that the public sector has fallen way behind in the pay

stakes was the one-day stoppage last Friday by the Civil and Public Servants Association and the Society of Civil and Public Servants. On the eve of this hammer-blow to what these two unions

view as the "rusty wheels of government machinery" Ken Thomas, general secretary of the CPSA, discussed with ROBIN WEBSTER the logic behind their decision to act now.



KEN THOMAS: "I have said before that you can't lead the public sector, but equally you can't let it lead."

Why we are bringing the government of the country to a halt....

ROBIN WEBSTER: With the CPSA and the SCPS representing the two largest trade union bodies in the Civil Service, the amount of damage you could inflict on the government is enormous. How far are you willing to go to win what you feel are the correct and long overdue pay increases for your membership?

KEN THOMAS: Well, there is a paradox at work here. Some people think that we have no muscle at all, but the real problem is that we have too much muscle and therefore can't use it. We have a responsibility to the country and therefore are using our power selectively and carefully. Both the SCPS and ourselves are complementary. If we took strike action without their membership's support and they went in to work it would ruin anything that we had planned, and vice versa. So what is unique in this situation is that this time we are working together. Between us we control a number of very important areas.

RW: Under the terms of your current action, you have pulled out only 2,000 people between

you and these must obviously be key people in essential areas. With your eye to your responsibility, how much care are you taking to ensure that the effects of the strike do not have any long-term impact on what might be called "innocent" areas?

KT: We have made it absolutely plain that we are not going to affect the sick, the needy, the unemployed or the old. They are not going to be involved apart from the one-day strike. This is because the Civil Service is responsible for the proper running of the welfare state. The second thing is that after making sure that these areas are not disrupted, we are going to hit what is technically called "the machinery of government", but which I suppose can be better referred to as revenue collection. The effect, one would hope, and this is our intention, is that the ordinary man in the street will not be troubled significantly. But the real pity is that while the one-day strike is not to bring the country to a standstill, but to show our power, the importance of industrial action is its threat, not its implementation. I have desperately striven to use the threat of it to bring about a negotiating situation, any my regret is that I haven't been able to achieve that.

RW: What sort of co-operation have you had from other Civil Service and associated unions? Have they been optimistic or pessimistic of your chances of success?

KT: I don't think one can express it that way. Each union has to decide its own policy in relation to the will of its members. I never criticise other unions for this reason. As I said in one recent circular, my members span those who say, for example, that we should call a strike and stay out indefinitely, and others who somehow believe that sweet reason will always prevail. Now, I think the Civil Service trade union movement reflects those extremes. What we are doing, however, is to look at the bulk of our members, who, after all, have been balloted, as the TUC concordat with government says this is the correct way to consult members. By 2 to 1 my members have said "We've had enough" and that is the ordinary lads, not the militants.

RW: At a recent meeting with Lord Peart, Lord Privy Seal, you raised the point that the government brought independent pay comparison, in the form of the Pay Research Unit, back into action but as yet have refused to implement the results of the latest comparison survey. What was Lord Peart's answer to this criticism?

KT: All he said was that they (the government) would be prepared to implement it but it would have to be staged and we should negotiate about staging. That really doesn't tell us anything. It seems like an advance but it really isn't. It is what we were told before; that we can have pay research back but we'll talk about its implementation. They said that 12 months ago and we have not got any further.

RW: But wasn't the agreement made on the basis that by bringing back the PRU, its research would actually be used in negotiations?

KT: It's as simple as that. Indeed, a pay board was set up to supervise the collection of the information and to ensure that nobody was on the fiddle. That pay board exists and is now examining all the evidence produced to that effect and a seal of approval, a public declaration, at the end which says that there

was no fiddle here; these facts were collected fairly.

RW: Details of your claims have been issued on the basis of the PRU results which you have analysed. How closely do the increases you are fighting for relate to the PRU figures? Are they exactly the same or some percentage amount?

KT: The effects of incomes policy over a whole range of people have been variable. I believe that the low paid suffered and I also believe that senior management suffered. In the middle range, somewhere or other, there is probably less effect seen. Because our system is sophisticated and complicated it is not easy for me to talk about a 14% increase or a 15% increase. What we do is to look at each grade in the Civil Service and

RW: So what you really are describing is a disease within the Civil Service, the symptoms of which are quite far advanced?

KT: Yes, that's right. What we are saying is that unless somebody actually applies some medicine to the situation in the Civil Service the patient will be dead. We will have catastrophic problems because whether people like it or not a large part of economic, social, and welfare life in the country is involved with government, and much of that day to day routine drudgery work has to be done by thousands and thousands of civil servants, whom the public basically dislike. Now if you haven't got staff to do that then

to Taiwan or some place like that, the prospects of doing it by any other means that employs British labour is, I think, very small.

RW: What effect will all the troubles have on the development of the government as a total entity?

KT: I am sure that we are faced with a great shortage particularly in the highly technical areas such as programming, other data processing levels, and that stands out as very important too. However, since computers have been a very intelligent use of the use of computers in clerical work. Almost as an institution, we have computers than anyone else in the world.

RW: So what you are fighting for then is better pay, less people because of better pay and better development for more people?

KT: Yes, what we are saying is that it's an old cry for those who work in the public sector. It's not that we don't want to do any better than those in the private sector; we don't want to set ourselves up as an elite. What we are saying is that the private sector has tangibly broken through the pay barrier by all sorts of methods such as productivity bargains.

We don't want to do any better than those in the private sector. We don't want to set ourselves up as an elite. The private sector has tangibly broken through the pay barrier by all sorts of methods such as productivity bargains.

each point on each grade and say, for example, "What does a 21-year-old typist who has just come in with X skills get, and what does a typist after 15 years' service in an outside firm get?" Therefore every point on every scale is examined. It is an enormously complex exercise.

So when I talk in terms of my members of around a 20% claim, I'm talking about a range that lies on either side of it. I don't want to give my members the impression that I will put in a 20% claim for everybody. Some will get 14% and others will get 22% depending on age, experience and qualifications.

RW: On recruitment, Campbell Christie, deputy general secretary of the SCPS, has said that the problems of staff wastage and the finding of new personnel are terrible. What trend has emerged within the CPSA?

KT: In my grades, the problems are even more appalling, because on the official figures my basic grade, which is called clerical assistant, is likely to see a 50% loss in the next 12 months. The turnover has always been big in that grade, around the 15% to 20% mark anyway, but the problem is that no one can actually give us any assurance that if we do lose this 50% we will get anybody back. Even if we get an increase in pay now, there is still a time lag before that works its way through the system, and there is the added problem of training.

One of the greatest tragedies is that in the end I suppose one would say that we wouldn't need to take industrial action as people leaving the Civil Service are in fact creating a form of industrial action themselves which has long term effects and to which people won't wake up until it is too late. It could be said that all we are doing with our present action is sharpening up something that is already taking place.

you gradually get a creeping situation where one day somebody will wake up and find that the whole of Social Security benefits and employment benefits, the machinery of government, is not working. Then there will be panic.

RW: If the government's internal computing capacity collapses, what will it do? Will it go outside for help?

KT: Well, if it tries to use external areas to prevent our strike action taking effect, then we are in touch with other unions and we are confident that they would black any work which normally would have been performed by our members.

RW: So there is no back door for the government?

KT: I don't think there is at all. They may be able to farm it out

MICROSEMINARS

16-BIT MICROPROCESSORS
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TUESDAY, MARCH 27, 1979

The increasing availability of 16-bit microprocessors poses a problem for the System Designer about the suitability of longer word length machines and differences between manufacturers' products.

This seminar examines the range of processors, compares their performance, selecting an M.P.U. and examines aspects of application.

The seminar is one of a series concerned with microprocessors and applications. Each seminar is relevant to designers and those involved in using microprocessors and will also be of interest to staff, university and college lecturers.

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Perkin Elmer adds to its menagerie

AN intelligent VDU workstation that can be programmed in Basic will be introduced later this month by the terminals division of Perkin-Elmer Data Systems. Called the Beaver, it comes with integral floppy disc storage, provides graphics facilities and costs less than £2,000.

The Beaver will be added to a group of Perkin-Elmer terminals with animal names—the Pussy-cat VDU output printer, the Owl VDU editing terminal, and Bantam, a teletype replacement BDU that costs less than £400 in quantities of 100.

Bantam features an LSI chip that was designed by Perkin-Elmer itself with the aim of dramatically reducing the total number of circuits in the terminal. The total is 19, compared with 100 in the earlier VDU model that employed a general purpose microprocessor.

Bantam, Pussy-cat, Owl and Beaver are otherwise known, respectively, as the 550, 650, 1200 and 8500.

Other Beaver features include a movable keyboard, a tiltable display, bi-synchronous communications and a range of terminal emulators. The floppy disc storage takes the form of two microfloppy drives each holding 80K bytes. The Basic is Anal standard with scientific and commercial extensions such as double precision arithmetic and string manipulation.

NERC and SRC in joint network

COMPUTING services for the Natural Environment Research Council are being enhanced by the setting up of a joint network with the Science Research Council to serve NERC's widely spread institutes, and by the unification of all the council's computing facilities under the direction of Dr Brian Rule, who at present works for Honeywell.

One of NERC's two existing mainframes, a Univac 1106, is being moved from Wallingford to Rutherford Laboratory where it will be run by SRC staff as part of the network which will include SRC IBM equipment as well.

NERC is also spending about £1 million on microcomputers for links to the Institute of Geological Sciences in London and similar establishments in Keyworth and Edinburgh, and a GEC 4070 has been bought for a headquarters information system.

Saved from scrapheap

SCHOOLS in West Oxfordshire are to share a redundant IBM 1800 minicomputer which Southern Gas has been using for analysis work, but is now replacing. The 32K, 16-bit machine is being installed free in a classroom at Bartholomew School, Lynton.

Pupils from several nearby schools will be able to use the machine and have their first experience of hands-on computing, which the teachers feel will give a big boost to motivation among the children.

System X company named

THE company formed by the Post Office, Plessey, GEC, and STC to export System X in the 1980s (CW, January 25) has been named United Telecommunications Ltd. No name was announced at the time of formation because the sponsors were hoping to use the name



Making the going easier

WITH today's high-speed passenger transport, British Rail has had to devise new ways to investigate the forces placed on train wheels operating at speeds of up to 130 mph.

Previously, information relating to this was collected offline by attaching measuring devices to the wheels and undercarriage that collected raw, unprocessed data. This was later fed into a mainframe for analysis. But now BR is using a pair of Miproc-16AS microcomputers from Plessey Microsystems to do the job in real time.

An array of strain gauges, using

the vehicle wheels as transducers, is mounted on each of a pair of axially opposed wheels to sample vertical, longitudinal, and lateral wheel/rail forces.

The Miproc-16AS systems log and process all this information while also providing a real time display of activity via a chart recorder or other equipment.

Commissioned by BR's research and development division at Derby, system hardware consists mainly of standard Miproc modules, but some special hardware was developed for the application.

CII-HB revamps bottom end of its Level 61 line

A MAJOR revamp of the venerable bottom end Level 61 line has been announced by CII-Honeywell Bull. At the same time the French company has reorganised its computer business into two autonomous divisions, one handling "systems and networks" and embracing Level 64, Level 66 and ex CII and Unidata computers, and the other for mass market products, taking in Level 61 and Level 62 for end-users, and the Level 6 minicomputer for the OEM market.

Called Level 61/DPS, the new system features an innovative dual-processor architecture, with a common resources processor, CRP, doing the computation, while a distributed resources processor, DRP, handles the peripherals and up to 16 workstations.

Each processor has its own main memory and a ROM which constantly monitors the performance of the other. The CRP comes with 64 or 96K bytes of 16K bit main memory, and two pieces of microcode. One carries the 114 instruction set and test routines for the DRP, and the other contains resident parts of the operating system, test routines and integral disc controller.

The DRP has 24 or 56K bytes of main memory, and two more pieces of microcode. The first carries test routines for the CRP and the processor's 110 machine instructions, and the second, 8K bytes of supervisor memory.

It also includes diskette controller, synchronous line controller, and the asynchronous line adaptor for the 18 terminals.

The link between the processors runs at 50K bps, which can handle messages from all 16 workstations simultaneously.

The disc capacity ranges from 11 to 230 Megabytes, and the 61/DPS takes one or two printers, with speeds up to 160 cps and 800 lpm.

The operating system is a superset of GCOS 61, called GCOS 61/DPS, and supports three programming languages: Cobol and Fortran compilers and a Basic Interpreter. A software suite designed to enable non-specialist users to adapt a set of basic packages to their

own businesses is also offered.

The basic system including one workstation, the operating system and Cobol compiler costs 150,000 francs, about £18,000, with a top price of 450,000 francs. Level 61/DPS is announced for CII-Honeywell Bull territory only and first deliveries are set for the third quarter of the current year.

● The new Nippon Electric Acos 77/250, revealed last week (CW, February 22) has turned out to be a major enhancement in very compact new technology of the 77/200, which is based on the Honeywell Level 62. Honeywell declined to say whether an Italian version of the new machine will be built for the European and US markets, but the company will need to enhance Level 62 further if it is to compete effectively with IBM's new System 38. Level 62 has done well, particularly in the US, as a replacement for IBM's System 3, the market for which System 38 is designed.

PO's modem supply improves

SUPPLY of the Post Office's Modem 12 to users of its 2,400 type Datel services is now improving as a result of the Post Office doubling the order from the maker, SE Labs, to 200 a month (CW, November 30, 1978). A Post Office spokesman said that the delay being quoted to customers was now being cut from the six months prevailing since last November.



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PRIME

IBM replies on French investment

YOUR International Section (CW, February 15) carries a report on IBM's European investment in manufacturing, that warrants a reply.

First, the headline of the report, "IBM hits back by cutting French investment," leaves the casual reader with the impression that such cuts are a fact. That is simply not the case. IBM France's manufacturing investment has continued to

grow. Evidence of that is the 167,000 sq ft extension currently under construction at the company's Montpellier plant.

Second, you base much of your speculation about possible reductions in IBM's manufacturing growth in France and Italy on the fact that the IBM 4300 series is to be manufactured in Mainz, Germany, rather than in either of the other two countries.

What you ignore is that IBM Germany's laboratory in Boeblingen played a significant role in the development of the IBM 4300 series, and the Sindelfingen components plant is heavily engaged in the manufacture of much of the associated technology.

These factors, among others, played a major part in our decision to manufacture the 4300 series at Mainz, a plant that has extensive experience of intermediate systems products.

You also say that the decision to build the IBM 4300 series in Germany is a "shot across the bows of the Italian government." May I point out that not only has IBM's manufacturing investment in Italy grown steadily over the years, but only two months ago IBM Italy announced its intention to build a new plant south of Rome.

buffer is a window to the database.

On a 16-bit machine the size of this buffer, which is direct addressable, is limited (about 64 Kbytes), but we are implementing a disc cache technique which will increase it to about 800 Kbytes if required.

It is no new technique, and is used by other machines than Nord. Any claim to originality on behalf of IBM is as valid as the claim that IBM invented virtual memory!

The comments about screens and relational databases in Marketview should be taken with a pinch of salt. You can't get much on an 80-character line, independently of whether it is stored as tuples or records. Repeating groups are a normal "user view" of things and they can be and often are represented in the Codasyl and relational approaches without storing them as such in the physical record structure.

Query by example is an excellent screen-oriented interface to a database, but unless you have screens which can take much longer formats than 80 x 24, you will have considerable problems presenting all but the narrowest tables!

Query by example is an excellent screen-oriented interface to a database, but unless you have screens which can take much longer formats than 80 x 24, you will have considerable problems presenting all but the narrowest tables!

JEREMY SALTER
Norsk Data AS
Oslo

Fred Lahond comments: In this fast-moving market specifications are quickly outdated. For instance, the IBM System 38 capacity has also been raised to 2,800 Mbytes since Marketview was published. Data given on the Nord system was based on literature distributed by the company at Sibos in Paris last September. The table was only intended as a guide to the facilities available and in some cases only the range of machines offering DBMS was named and not all the models.

CONFERENCES

PEOPLE and Systems — The Next Ten Years, is the theme of a conference on March 29-30 in Bournemouth. It is organised by the management services division of the Institute of Administrative Management. Booking details from Pamela Martin, Courses Department, Institute of Administrative Management, 22 High Street, Beckenham, Kent BR3 1BA.

AN education co-ordinators' workshop will be held from March 19-23, at the Monkey Island Hotel, Maldenhead, Berkshire. It is organised by BIS-Deltak and intended for those whose work involves in-house training and career development programmes for data processing staff. Further information from The Registrar, BIS-Deltak Ltd, 12-23 Stamford Street, London SE1 1NG. Tel: 01-851 9766.

MANAGING changing technology is the title of a one-day conference to be held at the Cafe Royal, London, on March 22. It is organised by BIS Applied Systems and will examine various management approaches used to handle current changes in technology. Details from Jackie Collings, course registrar, BIS Applied Systems, York House, 108 Westminster Bridge Road, London, Tel: 01-853 0868.

PROPOSAL preparation and source selection is the theme of a two-day seminar to be held at the Warwick Hotel, Warwick, Warwick, on March 15-16, and at the Royal Aeronaautical Society lecture theatre, London, on March 16-17. The seminar is sponsored by the TMSA, RASB, and the AUK, and will feature a panel discussion. Inquiries should be made to the TMSA/RASB Proposal Seminar, c/o State of the Art, Victoria House WC1S 4EJ. Tel: 01-243 4048.

THE Scottish Business Show will be held from March 19-23 at the Kelvin Hall, Glasgow. It is organised by BETA and Scottish Industrial and Trade Exhibitions. Details may be obtained from: Roy DUNN, BETA, 100 Kingsway, London, W2C 6PL, or William Taylor, SITE, 24 Hartington Place, Edinburgh EH10 4LE.

LETTERS

To: The Editor, Computer Weekly,
Dorset House, Stamford Street, London SE1 9LU

Training business systems analysts

ARISING from Owen Hanson's article, Training of Business Systems Analysts (CW, December 14, 1978), your correspondent Judy Cox raises some constructive points (Letters, January 18).

If a systems analyst aspires to be a business systems analyst it is essential, as she says, that he gains knowledge of business skills to augment and widen his technical training, and here can be the problem. However, I believe we can offer a solution.

Principles of business and industry is the title of a course we have designed precisely to meet the demand of DP staff in this

field, while we also offer O&M for systems analysts, dealing more specifically with the identification and solution of problems in the business environment.

If we can help any of your readers by discussing their needs we shall be happy to do so.

ANDY HOWARD
MSS,
Worthing

The Editor welcomes letters on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication. All letters are liable to be cut at the discretion of the Editor, unless correspondents state that their letters may not be cut.

Can you help out this school?

THIS is a request to Computer Weekly readers to help Heysham High School give enthusiasm and knowledge to some of the potential computer professionals of the future. Many of you must have seen preparation and storage equipment which is out of date and not work. By giving us your teletype, card punch, reader, verifier or even a about-to-be-updated computer you could help to give our "hands on" experience of what makes these machines tick. You think you can help, please contact me at the address below.

W. LLOYD
Heysham High School,
Morecambe LA3 1HS.

Computastars: don't miss your chance to enter



ALL of last year's Computastars winners are planning to defend their titles and there will be plenty of hard-fought contests for places in the Crystal Palace finals on Saturday, September 29. There will again be a strong overseas contingent with the SAS teams from Copenhagen aiming to take all three major trophies.

Closing date for entries is March 10, so get your challenge in as soon as possible by completing the entry form right. Full conditions of entry will be found on page 4 of Computer Weekly, February 15.

The dates of most of the heats have now been fixed and are as follows: Midlands, Alexander Stadium, Birmingham, April 8; South-West, Whitechurch Sports Centre, Bristol, April 22; Thames South, The Sports Centre, Crawley, Sussex, April 28; and North-East, Westcliffe Mount Sports Centre, Cleckheaton, near Leeds, May 13.

The dates and venues for Thames North-West and East Anglia have still to be settled.

The Scottish heat will be at the Meadowbank Stadium, Edinburgh, on May 20 as long as sufficient teams in that area enter. There is also the possibility of an Irish heat in Belfast. If there are not enough teams for separate Scottish and Irish heats, contestants will be invited to take part in one of the other area heats if they wish.

All teams have to compete in

ENTRY FORM

We have read and accept the conditions of entry for the Computastars 79 competition and would like to enter

man's teams

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Signature of manager in charge of unit

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Please circle appropriate centre.

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Please send this entry form to Computastars, 117b High Street, Croydon, Surrey. Tel: 01-859 6890

the heats to win a place in the final except last year's winning men's and women's teams who have been given byes into the final.

Computastars is jointly sponsored by Computer Weekly and

Wright Air Conditioning, and organised by Computastars of 117b High Street, Croydon, Surrey.

● Cheques for entry fees should be made payable to Computastars.

NEL researches into industrial robots

FOLLOWING the National Enterprise Board's move in taking a 48 per cent stake in George F. Brown, a manufacturer of robot welding and metal forming equipment (CW, February 15), the National Engineering Laboratory in Glasgow has begun an 18-month research programme into the development of industrial robots.

Financed specifically by the Department of Industry's Mechanical Engineering and Machine Tools Requirement

Board, the programme forms part of a research project being carried out by the Committee for Automated Small Batch Production. Main activities will include the evaluation of interface and performance standards and the enhancement of robots by equipping them with sensors.

While the use of micro- and multi-processor systems will be examined, the NEL says that it will not be assessing the cost of computer processing and communications functions.

Brussels conference on international data flow

THE impact of new technology and legislation on international data flow is to be the subject of a conference in Brussels from April 24 to 26, organised by European Study Conference of Upphaling.

Several well-known figures from the international data flow scene will be speaking, including Gerhard Stadler from the OECD, F.A. Bernasconi of the International Bureau for Information, John Eger, formerly director of the US Office of Telecommunications Policy, and consultant Adrian Norman.

Electronic funds transfer will be one of the most significant topics dealt with. Paul Henderson of the New York Federal Reserve Bank will suggest that international EFT needs supervision and control, touching such issues as the implication of mar-

kets open 24 hours a day, offshore banking, the total money supply, and whether we need a World Central Bank.

Samuel Oddi from the World Intellectual Property Organisation will argue that "information is a commodity in international trade," and Ricardo Saur from the Brazilian government will discuss the rights of States to control information crossing their borders.

The first day will be devoted to two parallel "foundation courses," one being "Law for Technologists" and the other "Technology for Lawyers." The second day will consist of the formal speeches, and the third, workshops. Fee for all three days is £325, and for the second and third only, £250.

Civil servants show teeth

● From front page

repayments will have to wait until the strike is over.

Balance of trade statistics, usually prepared at Somerset House, will not be compiled and

Confidential communications handled at the Government Communications Headquarters in Cheltenham and coding/decoding of communications traffic to and from overseas embassies at the Foreign Office have ceased too. The only union concession is the 'hot-line' to Washington which is being kept operational.

And while both unions have highlighted that they are not out to get the man in the street, it appears that industry and farmers will have to bear most of

the brunt as far as government payments and subsidies are concerned.

About £200 million a week in these areas are being affected by action at Ministry of Defence centres in Liverpool and Cheltenham, at the Department of Environment's centre at Hastings; the Ministry of Agriculture's centre at Gullford; and at the Scottish Office in Edinburgh.

Telex communications within some Department of Trade buildings have either been stopped or severely disrupted, and those hoping for a Premium Bond prize will have to wait until the strike is called off as "Ernie", the impartial computer at the Department of National Savings Centre in Lytham, is inoperative.

System that was too small

AFTER complaining to Computer Weekly about the performance of its Philips Data Systems Informer VRC, a user in Worcestershire, SMF Motor Factors of Stourbridge, has been offered a disc-based system by Philips in part exchange.

An SMF spokesman said, "We have never used a computer before and we were rather green when we installed the Informer last August. Until now Philips has insisted that it could handle our stock control system as well as our accounting work even though the system needs more than 8,000 ledger cards; far more than the Informer could handle in normal working hours."

A Philips spokesman said, "We originally thought that the SMF application would require only 3,500 cards. Our managing director has now written to SMF agreeing to exchange the Informer for one of our bigger disc-based machines." This is to be done on a part-exchange basis.

Prestel US agreement

THE long-awaited formal licensing agreement between the Post Office and Inpac, covering the marketing of the corporation's Prestel videodata system in the US, has been signed. This has removed a major barrier to partnerships that Inpac hopes will offer videodata services in the US by the end of the year.

Inpac managing director John Pearce said that it might be two

or three months before the first partner is announced (CW January 11). "We are in final negotiations with companies some in the business market and some in the domestic, but I won't be drawn on timescales."

Inpac's 12-man sales team is also selling direct to closed user groups and corporations, and has received several letters of intent from potential users.

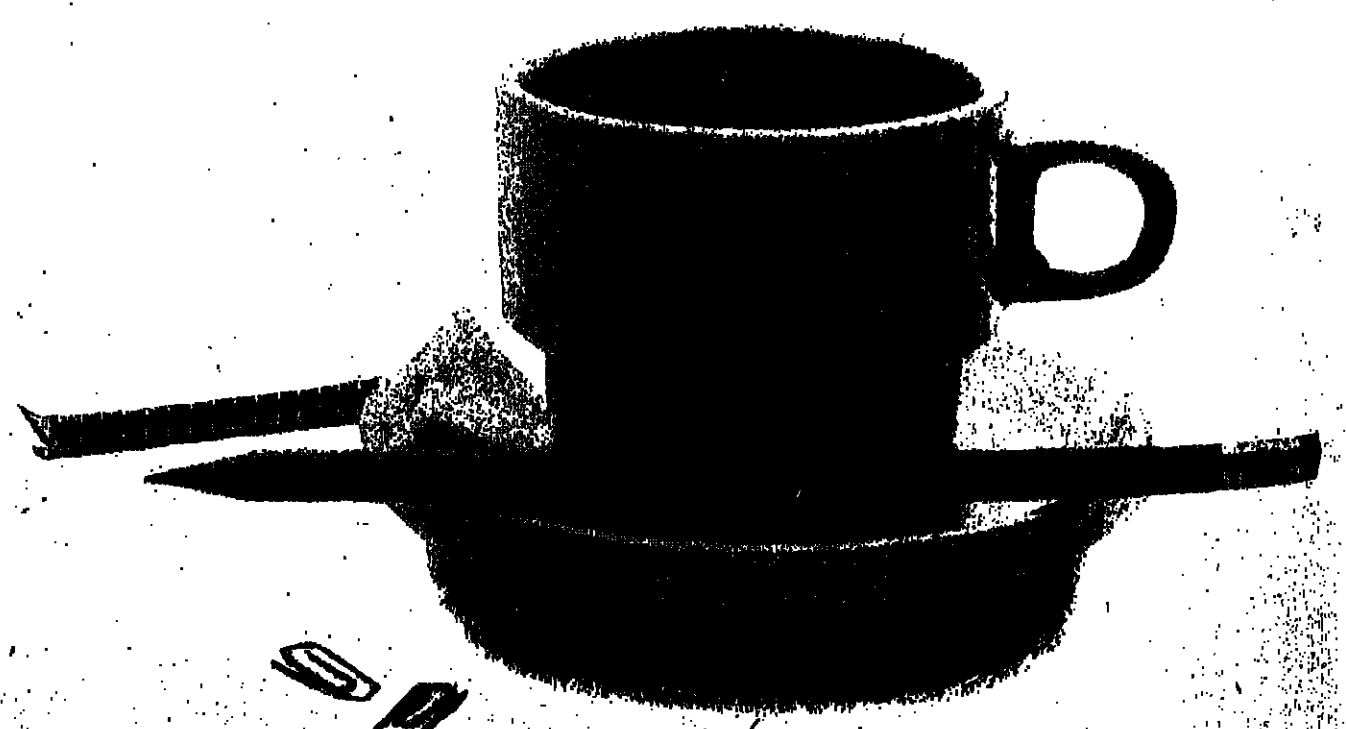
Customs' faulty figures

● From front page

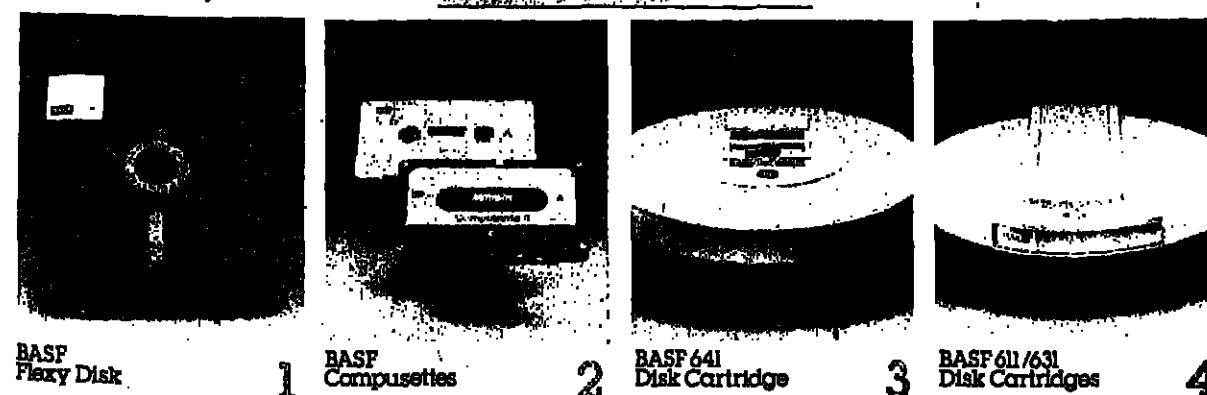
have been entered under a different heading.

But Customs is not yet prepared to reveal the nature of the "items" that have been "incorrectly included under the auto-

gus and hybrid heading. Customs said, "At the conclusion of the inquiry a more accurate picture will emerge and details will be made known. A new figure will then have to be published."



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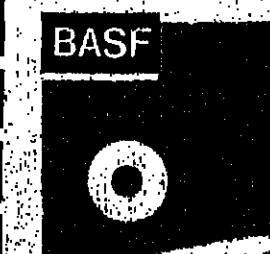
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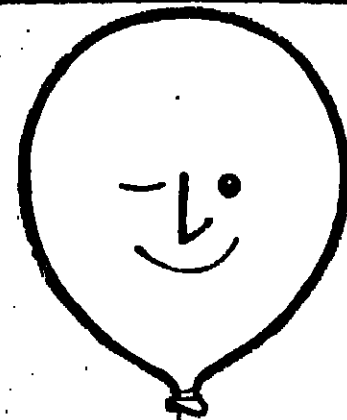
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Our clients are seeking several graduates with a good degree in English and/or other languages to train as Technical Editors within a commercial applications environment. The work will be to standardise and quality assure documentation provided for software packages. *Ideal opportunity for independent-minded and highly self-motivated graduates to enter the d.p. industry by embarking on fascinating and absorbing work.* **Contact: Mike Creamer**



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CIRCA £8,000

With 7+ years' PROGRAMMING EXPERIENCE our client would like to consider you for one of the CONSULTANT PROGRAMMER vacancies, which have just become available.

This is a rare opportunity to join a successful INTERNATIONAL company situated just outside London offering excellent working conditions.

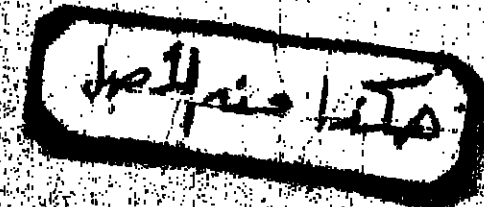
You will be responsible for managing a team of programmers through all stages of a project reporting to a Project Leader or Systems Manager. Your responsibility will also include the preparation of progress and resource

reports as well as assisting in the recruitment of all level of programming staff.

There are, at present two IBM 370/158s used for a whole variety of applications, program development is on-line. Program language is COBOL and there is no lack of new interesting projects to get involved in as well as opportunities to keep up-to-date technically with internal and external courses.

There is a comprehensive relocation package available plus the usual top-company benefits. In the first instance, please contact DENNIS ANDREWS on 01-402 0933 for an application form.

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Staff Services Division of BOC Database Group and
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South West Thames Regional Health Authority OPERATIONS STAFF

Tooting, London SW17.

The South West Thames Regional Health Authority require additional operations personnel to be based at the Regional Computer Centre located in the grounds of the Springfield Hospital, Tooting, London SW17.

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SENIOR OPERATORS

£4496*

The essential requirements for these positions are around 3 years' George 3 experience, preferably in a medium to large installation, coupled with the ability to progress rapidly into a supervisory position.

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These positions will be of particular interest to candidates with at least 12 months' George 3 experience and the desire to develop their professional skills in an expanding and dynamic environment.

For further details, phone Sylvia Lyons or Les King, up to 8.00 p.m. each evening, or write to:

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FREEPOST, London WC2N 5BR, 01-839 3351.

*includes shift allowance and London weighting.

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information systems
computer personnel

P.O. Box 32437, Braamfontein,
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All interviews will be conducted in London.

b&c recruitment 276

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Databank's major function is to develop and process the EDP requirements of all the New Zealand Trading Banks. In addition we develop and process for some 7000 other New Zealand organisations.

In recent years we have developed our own nationwide distributed network. This links 12 computer centres to each other and to many hundreds of terminals. Our hardware includes two 3MB 370 165 II, 4 x 370 145, 7 x 360 40 and 26 Data General Eclipses.

In recent years Databank has undertaken extensive recruiting in the United Kingdom. Most of the people recruited have happily settled down to their new environment. Continual expansion has created further opportunities for:

Programmers:

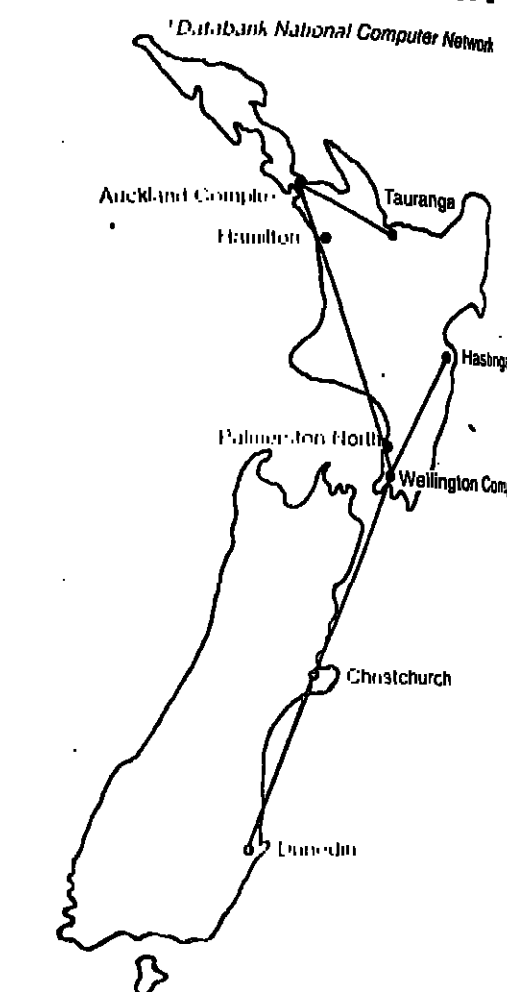
2-3 years experience in IBM assembler or other languages.
If other languages - we will retrain.

Systems Programmers:

With any of the following skills:- experience of using IBM equipment for on-line applications * a thorough knowledge of assembler and internals of IBM OS/VS or MVS * experience in programming mini-computers as front ends.

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Please mail a brief resume to:
Manager Organisation Development
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175 The Terrace,
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Alice found that having no room to grow was uncomfortable and frustrating.
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1978 was another extremely successful year for ICL, turnover was up by 22% to over £500m, with over half the business coming from overseas.

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A feature of our development plan is the introduction of a worldwide systems network based on an impressive range of hardware from ICL minis, such as System Ten and the 1500 series, through to very large 2900s.

Since ICL operates in 80 countries worldwide, international travel is a possibility as is the chance for longer term overseas assignments. There is also tremendous project variety, with the chance to specialise in systems software, pure systems development or maintenance and user support.

But perhaps the greatest attraction is the opportunity for

career development. Working for a computer manufacturer means that you could make career moves into functions such as marketing, finance, or technical support, or perhaps consultancy with our subsidiary Dataskil, Europe's leading software house.

We would like to hear from you if you have experience in some of the following areas:

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- ICL 1900 or 2900 COBOL
- George III, VME/B
- JDMS
- Real-time systems
- Production and Manufacturing systems
- Marketing and Finance systems
- Engineering and Spares systems

Systems Software

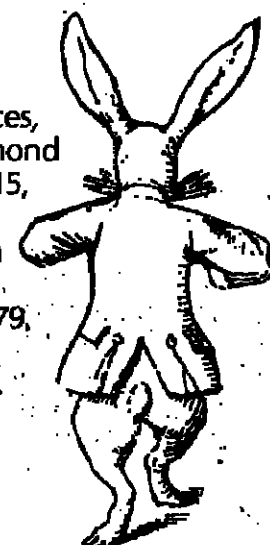
- Diagnostics
- Construction of VME/B systems
- Large systems design and programming standards
- VME/B Superstructure products and systems programming
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- TP systems software and applications
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We will be holding interviews over the next two weeks so write now giving brief career details to: George Battersby, ICL Recruitment Services, 93/99 Upper Richmond Road, London SW15, or if you require further information telephone him on 01-788 7272 ext 4179. Please quote reference CW1272.

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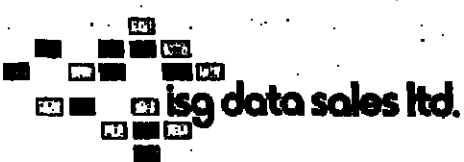
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N.W. SURREY

£4000-£7500

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- ★ CORAL 66/FORTRAN/ASSEMBLER
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our client can offer these positions:

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- ★ ANALYST/PROGRAMMER
- ★ SYSTEM SUPPORT PROGRAMMER

- ★ BURROUGHS/DEC EQUIPMENT
- ★ CROSS-ASSEMBLER
- ★ NETWORK COMPUTER SYSTEMS
- ★ MINI COMPUTER EXPERIENCE

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- ★ SYSTEMS PROGRAMMER
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Salaries will be commensurate with experience but should not prove a problem to persons wishing to join the company. Located in the attractive countryside of Surrey, the modern offices are well serviced by three British Rail stations and there is a large car-park next to the building.

Ref: S2/2202

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA

OS/VSI IMS/VS DB/DC

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You should have 2-3 years' experience of OS/VSI and IMS/VS DB/DC. The configuration is a 2Mb IBM/370 Model 148 and is currently being extended.

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A highly competitive salary is offered together with excellent conditions of employment. A generous relocation package is also available where appropriate.

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Applications are forwarded to the client concerned therefore companies in which you are not interested should be listed in a covering letter to the Position Number Supervisor.



outstanding opportunities in the Netherlands

ICI Europe has responsibility for co-ordinating ICI activities in 15 countries in continental Europe, including sales organisations and manufacturing locations.

The main centre for management services activity is ICI Holland BV in Rozenburg, which is also a major manufacturing site. The Europe Computer Centre operates there on an IBM/370 under MVS and is connected to most of the continental locations as well as to an ICI computer centre in the UK.



Experienced PL1 Programmers

System development activity is centred at Rozenburg where a multi-national team of analysts and programmers are working on projects including batch, real-time and distributed processing applications.

In addition to PL1 a knowledge of IMS would be useful and candidates should be prepared to do some travelling in Europe if required.

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The Leicester Division markets many packages, but the major product is the Small Factory Systems package (SaFes) which operates only on the System Ten range of computers for which Safe Computing Ltd has granted I.C.L. an exclusive world-wide marketing license, with 117 sales to date.

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The job involves pre-sales support and account management responsibilities, and requires indepth systems knowledge.

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AP3/4 £4017 to £4817
(including supplement and London weighting)

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For further details or an application form please write or telephone (01-303 7777 ext. 782), D. Jarvis, Operations Manager, Data Processing Department, 9 Brampton Road, Bexleyheath, Kent DA7 2EZ.

Closing date 18 March, 1979.

Bexley London Borough

BRIGHTON POLYTECHNIC

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Department of Computing and Cybernetics

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Preference will be given to any person with the relevant experience in those with several years' experience in other disciplines who have the right attitude for the work of a computer department. The Borough is currently equipped with an ICL 1903T, 1905T, 1907T, 1908T, 1909T and magnetic tapes. Remote terminals are in use and further development is planned. This post offers a varied and demanding job in a modern office bordering rural Hertfordshire. Temporary housing (up to two years), 100% removal expenses (100 mts.), generous relocation costs and lodging allowances - when appropriate needs to move.

For further information please contact Ian Gray, 01-666 6666, Ext. 2626, Ref. ORA/452.

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Applications are sought for this position which is the senior of two in the Data Control Section.

Applicants should have at least two years' experience in data control as the front line contact with user departments, a firm but flexible personality as essential as a knowledge of job assembly, data procedures, and magnetic media library maintenance.

If you think you possess these qualities and would like further information ring Mr. Cook on 01-366 6666 Ext. 2461, Ref. ORA/457.

Application forms are available from the Borough Treasurer, P.O. Box 54, Civic Centre, Silver Street, Enfield EN1 3XP (tel. 01-366 6666 Ext. 2678). Closing date 18 March, 1979. Please quote appropriate reference.

London Borough of

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The work entails helping to set up a new system, might provide occasional visits to the parent company America.

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The successful candidates will have experience in applying small computers to equipment in an industrial environment, together with some knowledge of at least one of the following areas:

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MYRIAD

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The company offers excellent conditions of employment, including five weeks' holiday, an excellent starting salary and relocation assistance where necessary.

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Our client is developing several on-line real-time applications on an IBM 370/158 computer using IMS and DC/DB software. Several new systems are scheduled for development in both financial and production application areas. The company, an engineering organisation employing over 1,500 staff, offer excellent conditions of employment. These include five weeks' holiday and an active sports and social club.

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E1/0103

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Applicants should possess BSc or equivalent in Engineering, Computer Science or Physics together with minimum 3 years' practical industrial experience. A knowledge of PDP-11 computers and RSX-11 would be an advantage.

The work will be concerned with the modification of software on large trainer systems and/or the supervision of software engineers engaged on marine trainer systems.

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With HNC or equivalent and two or more years' practical real-time programming experience, a

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Duties will entail writing, testing and commissioning software to specification and total involvement with the system from conception to final completion.

We are also looking for

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Preferably with a degree in Computer Sciences and minimum six months' relevant experience.

These posts offer ample scope for career advancement and the opportunity to further your skills and experience within an exciting and exhilarating environment.

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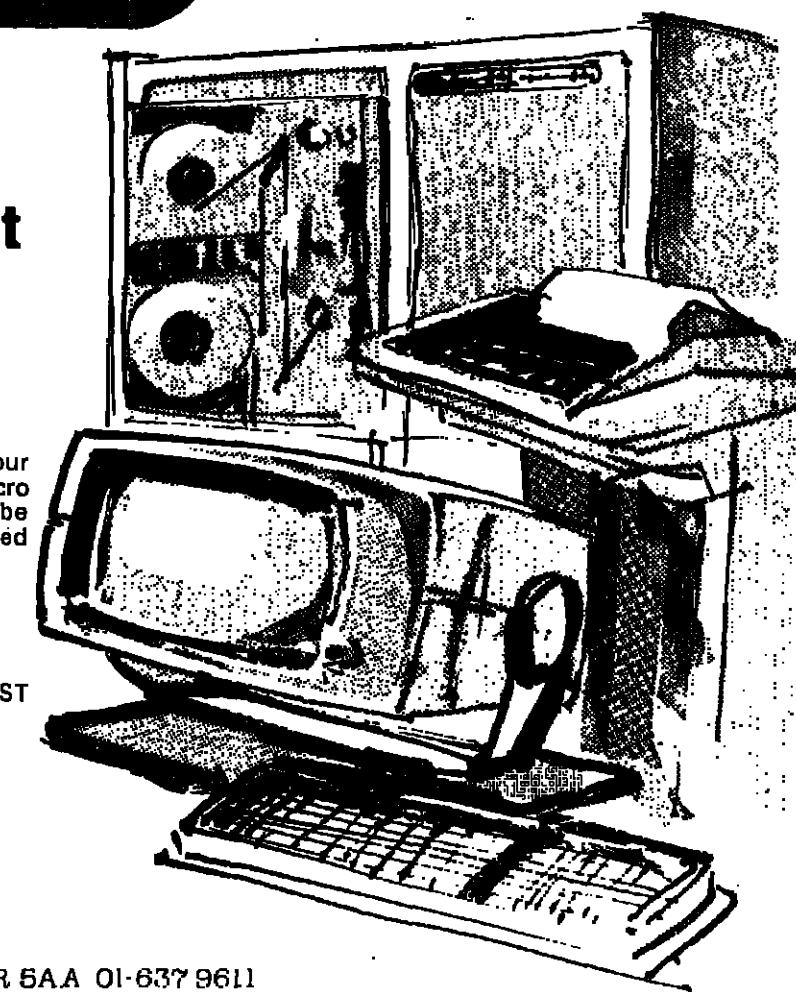
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They will provide a back-up to a successful sales force. This will involve customer liaison, feasibility studies for particular applications, the design of systems and their implementation. Candidates should have about two years' computing experience and the ability to communicate effectively, both verbally and in writing. Some travel at home and possibly overseas may be necessary.

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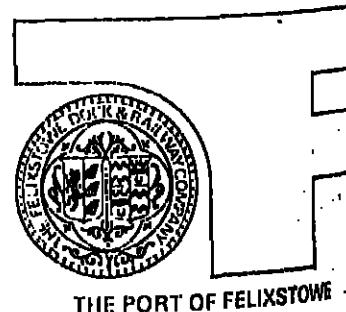
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SYSTEMS DESIGNER c £7K
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The Felixstowe Dock & Railway Company, the largest independent Port Authority in the U.K., is currently in the process of significant improvement in its computer facilities.

The existing installation is shortly to be replaced with a multiprogramming configuration with transaction processing capabilities. In addition a system is being developed which will use a second, dedicated computer to provide a real-time service to port operations.

A real-time SYSTEM DESIGNER is required to assist in the development of the new system, together with redesigning existing systems to utilise the new facilities. Applicants should have an in-depth experience of all aspects of real-time systems and must have played a significant part in the implementation of such systems.

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OPERATORS are required, preferably with experience of a multiprogramming environment. Consideration may be given to suitably qualified applicants on junior level.

The above positions will be eligible for the company 'phase 4' review in July together with removal expenses where appropriate.

Applicants should apply to Personnel Department, Felixstowe Dock and Railway Company, Felixstowe, Suffolk, or phone D.P. Manager on Felixstowe 223 extension 130, or Eyke 363 (evenings).

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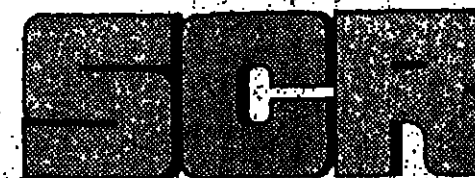
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SURREY

Applicants for these positions will have gained a strong knowledge of RPG II (3 yrs +) on IBM equipment and have a good understanding of CCP. A background in commercial systems will be an advantage but full training will be given in O & M, D.P. and business procedures.

The data processing department is engaged on a variety of development projects (most of which use on-line techniques) and has expansion plans that continue well into the next decade. A System 38 is on order to replace the System 3 currently installed, so persons joining the company now can be assured of an interesting and rewarding future.

In addition to a pension scheme, four weeks' holiday, BUPA and L.V.s, employee benefits include an annual bonus in the region of 10%. The offices are easily accessible by road or rail from most parts of Surrey and relocation expenses are paid where applicable.

Ref: S3/0103

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RESEARCH VESSEL SERVICES

Scientific Officers

The Research Vessel Services operate and maintain several oceanographic research ships and provide a wide range of instrumentation and computing facilities for the marine research programmes of NERC component bodies and university departments.

Applications are invited to fill the following posts which all involve spending some time working at sea.

COMPUTER ENGINEERS. Post Ref. RVS/SC/78/6-8

Computer Engineers with a good electronics background are required for interfacing development and maintenance work on oceanographic data acquisition and processing systems. Currently in use are PDP11, IBM 1800 and IBM 1130 computers.

ELECTRONICS/INSTRUMENTATION ENGINEER. Post Ref. RVS/SC/78/10

An Electronics/Instrumentation Engineer is required to join the Shipborne Instrumentation Group. The work will involve calibration and maintenance of a range of oceanographic sensors and instrument systems for use on research ships. Some design work on equipment modification may be involved.

SYSTEM ANALYST/PROGRAMMER. Post Ref. RVS/SC/78/8

A Systems Analyst/Programmer is required for programming support of the shipborne computer systems. Experience in real-time programming using Fortran, RTL/2 or Assembler languages would be desirable but not essential.

QUALIFICATIONS/EXPERIENCE

Normally below age 27 with a degree, HND, HNC or an equivalent qualification in an appropriate subject. A pass in BCS Part II and relevant experience is acceptable for the computer posts.

SALARY SCALES

Appointments will be in the grade of Scientific Officer with salary scale of £2,839-£4,415 p.a. The starting salary may be above the minimum depending on qualifications and experience. In addition under the present regulations a Scientific Officer could expect to increase his/her earnings by at least £1,000 p.a. with normal sea-going duty. There is a non-contributory pension scheme.

Staff at the NERC are not Civil Servants but their pay and conditions of service are similar to those of the Civil Service.

Further details and applications forms may be obtained from: Jan Hill, Research Vessel Services, No. 1 Dock, Barry, South Glamorgan CF6 6UZ. Telephone Barry (0446) 737451. Please quote post reference: Closing date for receipt of applications: 15 March, 1979.

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Technical Computing

The Research and Development Division of the British Railways Board at Derby wishes to strengthen its engineering computing team. The team is involved with a wide variety of technical computing work both as projects in their own right and as support for the various engineering departments of the Board. The areas covered by the team include:

Computer aided design and analysis using interactive graphics.
Support and extension of the finite element package.
Wide range of programmes and systems for experimental data capture and analysis.
Development and application of structural design and analysis techniques.
Mechanical/Electrical/Civil Engineering support.

The team has access to an IBM380/168 main frame computer, is responsible for the software of many mini computers and is beginning to be involved with micro processors.

Some experience of engineering or technical computation is essential. The minimum qualification is a degree or equivalent in Engineering, Mathematics or Science.

The commencing salaries for the junior posts will range from £2,803 to £4,883 plus additional payments for certain educational qualifications and for the more senior posts £4,740 to £5,184. There is a contributory Pension Scheme and the transfer of existing pension rights can, in most cases, be accepted. There are also free and reduced rate rail travel facilities.

Applications stating age, education, qualifications, experience and present salary should be sent to:

Headquarters Staff & Services Manager,
British Railways Board,
222 Marylebone Road,
London NW1 6JL
quoting ref: 8113.

Programmer

Commencing salary around £4500

The Computer Section is responsible for developing and maintaining a variety of systems on the Council's 1802T installation with communications equipment.

WE WANT

- A PROGRAMMER with about 18 months' experience in COBOL or PLAN.
- Experience of ICL 1800 but programmers trained on other machines will be considered.

WE OFFER

- A starting salary around £4500 on a 'scale' rising to £5358 p.a. inclusive.
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Please contact John Allsop, Personnel Department, 22-28 Clarendon Road, Broomfield, Essex SS1 4LH. Telephone 01-478 3028 extension 509 for an interview.

Redbridge
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MIDLANDS/WEST COUNTRY

D.P. Recruitment Specialists

MANAGEMENT PROJECT LEADERS, SYSTEMS ANALYSTS

PROJECT LEADER At least 8 years in Commercial D.P. Systems, to lead Project team reporting direct to Systems Manager. Experienced with On-line CICS. Software packages and time sharing using IBM 370 hardware an advantage. Area: Birmingham. Salary package to £8,000. Ref: SA 185.

COMPUTER MANAGER Required to run large Mini using C.P.U.'s and V.D.U.'s. At least 2 years' programming in Basic+ or similar language. Area: Birmingham. Salary: c£5,000. Ref: M48.

SYSTEMS EXECUTIVE At least 5 years in D.P. to advise clients on Systems development and participate in selling Operations. Working knowledge of numerous applications required. Area: West Midlands. Salary: c£8,000 plus expenses. Ref: P54.

SYSTEMS MANAGER with at least 5 years in D.P. including Real time, Database and Time sharing applications in both Mini and Mainframe environment. Area: Nottinghamshire. Salary to £7,000. Ref: SA216.

SYSTEMS ANALYST At least 4 years' commercial systems using IBM or ICL hardware. Area: Nottinghamshire. Salary: c£8,000. Ref: SA169.

PROJECT LEADER At least 4 years in Commercial systems. Area: Gloucestershire. Salary to £8,600. Ref: P19.

PROJECT LEADER At least 4 years in Systems Analysis and Design together with a formal Cobol programming background using ICL Hardware. On-line and Batch applications essential. Area: Birmingham. Salary: to £8,600. Ref: SA167.

PROJECT LEADER At least 4 years' Commercial Systems, specialising in financial applications especially Order Processing or General Ledger. Area: West Midlands. Salary: package around £8,500 plus liberal car and mileage allowance. Ref: SA218.

SYSTEMS ADVISOR required by International Mini-computer manufacturer for Pre and Post sales activities. They would be required to specialise in implementing software packages. A formal programming background is required plus a minimum of 2 years' Systems Analysis. Although the position is based in Birmingham covering the Midlands area occasional travelling throughout the U.K. would be required. Salary to £8,500 plus Bonus and Car allowance. Ref: SA201.

SENIOR SYSTEMS ADVISOR for main frame manufacture. At least 4 years' commercial systems including knowledge of Cobol or RPG II. Area: Leicester or Bristol. Salary: c £8,000 plus car allowance and generous expenses. Ref: SA128.

SYSTEMS SUPERVISOR. At least 4 years in Analysis and Programming in RPG II. Knowledge of stock control or order processing applications an advantage. Area: Redditch. Salary to £8,000. Ref: SA189.

SYSTEMS CONSULTANT. Experienced with IBM small mainframe and Minis. Language RPG II. Area: Gloucestershire. Salary: To £6,500 and Company Car. Ref: SA180.

SYSTEMS ANALYST. At least 3 years' experience using IBM System 3 hardware. Area: Nottinghamshire. Salary: To £6,500. Ref: SA208.

SYSTEMS ANALYST. At least 2 years' Systems design with programming background. Knowledge of Database and Real time an advantage. Area: Nottinghamshire. Salary: To £8,000. Ref: SA125.

SENIOR ANALYST. At least 4 years in D.P. Systems. Area: Loughborough. Salary: to £8,000. Ref: SA193.

SENIOR SYSTEMS ANALYST. At least 4 years' Commercial applications. Area: Northampton. Salary: £8,000+. Ref: M36.

JUNIOR SYSTEMS ANALYST. Around 12 months' systems experience. Area: Birmingham. Salary to £4,500. Ref: SA210.

PROJECT LEADERS & SYSTEMS ANALYSTS. Owing to expansion our client is seeking D.P. Personnel at various levels. Area: Coventry. Salary To £6,800 plus general relocation package. Ref: SA214.

ANALYSTS/PROGRAMMERS

ANALYST/PROGRAMMER. At least 3 years' commercial applications for IBM Systems 34. RPG II an asset but not essential, mainly Systems development work. Area: West Bromwich. Salary: To £8,000. Ref: P17.

ZAMBIA ANALYST/PROGRAMMER. At least 3 years' experience using IBM Systems 3 hardware. Minimum period of contract 2 years. Salary negotiable plus expenses and completion gratuity. Ref: M46.

TECHNICAL SUPPORT ANALYST/PROGRAMMER. At least 2 years' commercial applications including Production Control. Mini manufacturer. Area: Birmingham. Salary: c £5,000 plus company car and expenses. Ref: SA197.

PROGRAMMER/ANALYST. Required at least 2 years working with IBM small mainframe or minis. Real-time experience essential for Pre and Post Sales Support work. Area: Staffs. Salary: to £8,000 plus generous car allowance. Ref: P389.

SENIOR ANALYST/PROGRAMMER. With RPG II experience. Senior Programmer without Analysis experience considered. Area: Rural Wiltshire. Salary: To £8,000. Ref: SA180.

ANALYST/PROGRAMMER. 1 year plus Cobol or willing to retrain experienced programmer in Cobol. Area: Cannock. Salary: c £5,000. Ref: P390.

DEVELOPMENT ANALYST/PROGRAMMER. At least 2 years' Cobol, small installation. Area: North Birmingham. Salary: c £5,500. Ref: SA220.

ANALYST/PROGRAMMER. 2 years' Cobol. Any hardware. Area: Wolverhampton. Salary: c £5,000. Ref: P411.

CHIEF PROGRAMMER. At least 4 years in programming with good working knowledge of NEAT 3 or MUMPS. Area: Staffs. Salary: To £7,000. Ref: T.272.

FORTHAN PROGRAMMER. With real time and interactive mini experience to work on Marketing and Production Control Systems. Permanent or Contract position. Area: Swindon. Salary: Negotiable. Ref: P130.

PROGRAMMER. Must have experience in S.N.A. using IBM Terminals. Travelling throughout U.K. involved. Salary: c £5,500 plus expenses. Ref: P409.

SUPPORT PROGRAMMER for Pre and Post support. At least 2 years using Cobol. RPG or Assembler. Mainframe manufacturer. Area: Birmingham. Salary: to £6,000. Ref: P94.

SYSTEMS PROGRAMMER. For Software development around 2 years' programming experience with knowledge of Cics. Area: Lincolnshire. Salary: £4,500. Ref: SA196A.

PROGRAMMER. At least 18 months' Programming in Cobol PL-1 or Assembler. Area: Burton-on-Trent. Salary: To £6,000. Ref: P367.

SOFTWARE PROGRAMMER at least 2 years' Assembler experience with knowledge of Cobol. Main softwarehouse. Area: Birmingham. Salary: c£5,500. Ref: P410.

SYSTEMS SOFTWARE PROGRAMMER. 2 years' plus experience using Univac hardware under Executive 8. Area: Wiltshire. Salary to £8,000. Ref: P412.

OPERATIONS/PLANNING

OPERATIONS PLANNING ASSISTANT. Must have several years' experience with IBM Hardware using JCL, OS together with a knowledge of Software or packages. Area: Staffs. Salary: c £5,000. Ref: SA178.

OPERATIONS TEAM LEADER. At least 3 years' ICL 1900 experience with sound knowledge of George III. Area: Wiltshire. Salary: c £4,500. Ref: 0138.

OPERATOR. At least 18 months' Operating ICL 1800 under George II or 2980 under DME. Area: Lincolnshire. Salary: c £4,000. Ref: 0136.

SENIOR COMPUTER OPERATOR. At least 18 months using IBM OS DOS under DOS/VS. Area: Birmingham. Salary: Ref: 0149.

SENIOR COMPUTER OPERATOR. At least 18 months operating IBM 370 under DOS/VS. Area: Birmingham. Salary: Ref: 0155.

COMPUTER OPERATOR/DATA CONTROLLER at least 2 years' Operating/Data Control experience. Any hardware. Area: Gloucestershire. Salary: c £4,000. Ref: 0159.

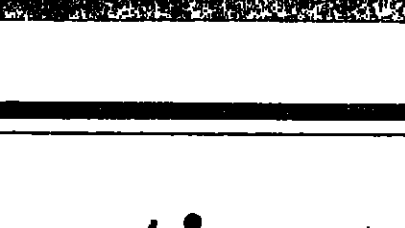
COMPUTER OPERATOR at least 2 years' Operating ICL 1800 or 2900. Area: Swindon. Salary: c £4,000. Ref: 0158.

CHIEF OPERATOR at least 4 years' operations experience using ICL 1900 range under Executive and George II. Ability to supervise staff at various levels. Area: Gloucestershire. Salary: negotiable. Ref: 0160.

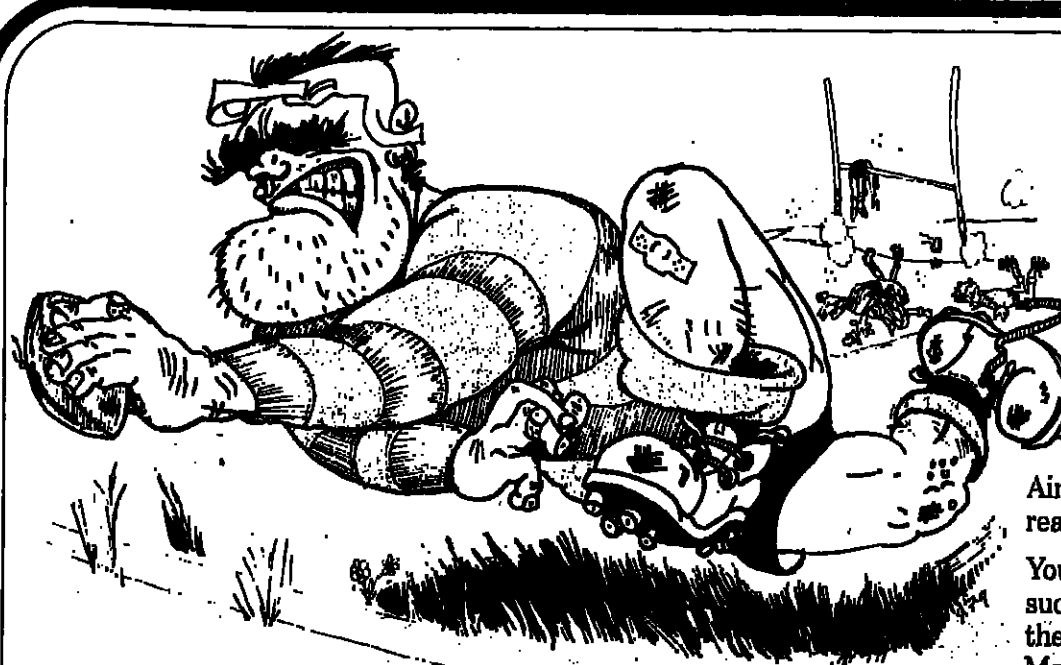
NETWORK CONTROLLER, experienced in on line network control. Area: Gloucestershire. Salary: Negotiable. Ref: 0161.

Contact: Graham Aston, M.E.C.I. MARTINS COMPUTER SERVICES
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Birmingham B5 4HQ. telephone 021-643 2111. 24 hour answering service. Evenings and weekends 021 454 0131

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Cathy Tracey on: 01-935-0671 (during normal office hours) or 021-454-8361 (evenings & weekends)

All replies will be treated in the strictest confidence.

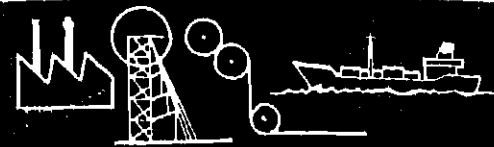
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NORTHERN APPOINTMENTS



Plenty of work—and much else—on offer in the North

IN taking a look at the opportunities in data processing in the North it is worthwhile considering the general market situation as a prelude to looking more specifically at the area.

In general terms the market-place appears very good from the point of view of an applicant seeking a new position, be it in operations, programming, systems analysis or sales.

With the exception of senior management positions, where the competition is always intense, there would certainly seem to be more jobs on offer than candidates to fill the vacancies.

When considering the opportunities in any area and acknowledging the shortage of experienced personnel, it is worth mentioning the major features for which candidates are looking in a job.

I would suggest, not necessarily in order of priority, that the major features to be considered are:

1. — The general background, which includes job content, career path, equipment, technical content and the level of commitment of top management to data processing.

2. — The financial considerations including salary levels and the value of those rewards to the recipient.

If these criteria are satisfactorily met then, even in today's market-place, candidates of good quality can

always be found, although this can require considerable effort on behalf of consultants or client companies alike.

How then do the job opportunities in the North measure up to these key criteria?

To deal firstly with the general background, the North does not lag behind any other sector of the UK in these respects. Throughout the region there are numerous examples of very progressive companies which are at the forefront in the use and continuing development of the latest technology.

There is a comprehensive range of installations covering all the main hardware — mainframe, mini and including quite extensive use of distributed processing techniques. Thus in technical terms there is no difficulty in satisfying any particular candidates so far as the hardware with which they wish to work is concerned.

Acknowledging that candidates can have a preference for a particular manufacturer's equipment, the major consideration in

any company's data processing department must be the aspect of service to the organisation, and the types of organisation in the region should be mentioned.

There is a wide spread of commercial, financial and industrial organisations, and therefore considerable scope for professional staff

manufacturing systems.

The retail trade is well represented, including chain store operations, multiple retailing and mail order. As some of the major names in the country are located in this region, the retail trade accounts for some major installations which represent some of the

reminder of the type of opportunities in the region it is important to consider carefully the financial aspects.

Much has been said and written about the differentials in salary levels in different parts of the country allied to the cost of living in various areas. In general terms the cost of living is definitely lower in the North and house prices, particularly compared with the Greater London commuter area, are much lower and offer better value for money.

Hand in hand with this goes the distance commuted and the significant cost of so doing. Generally in the North people seem to live much nearer their place of work, probably because they do not need to go a long way away to be able to buy a house in pleasant suburban or rural surroundings.

Underlining the differential in respect of housing costs is the fact that my own organisation is frequently contacted by candidates who wish to move North, often because at the early stages of their

career and married life it is the only opportunity they have of being able to afford to buy a house.

It is dangerous to make categorical statements about salaries because it seems that whatever the salary one quotes it can always be proven wrong in a subsequent advertisement. However, as a guide the following are I think reasonable market indicators: Programmers (1 year Cobol), about £4,300; programmers (2/3 years), about £5,000/£5,300; senior programmers (5 years), about £8,000; systems analysts (3 years DP), about £5,500/£6,500; senior analysts (5/6 years DP), about £6,300/£7,000.

Obviously, using a generalisation such as "North of England" there can be considerable variation in these figures, but they represent the level that needs to be offered and which candidates can reasonably expect to receive. Various additional factors also come into play, including productivity bonus.

While it is possible to discuss salary levels in general systems development terms

it is not so easy in the case of sales jobs which attract total packages in the £10,000 to £20,000 range depending on seniority and overall responsibility.

Finally on the question of money, I am very much of the view that if housing costs, general living costs and commuting costs are taken fully into account then the difference in salary levels between the North and South does not fully reflect those factors. In the salaries in the North are not that much lower.

This last comment means in effect that one has more value for one's work and that in effect there is more money left over for personal and leisure spending. And here the Northern region has plenty of areas of natural beauty — the Lake District, Peak District and the Yorkshire Dales all with easy travelling distances of many major contributions.

The quality of life is good and the environment is clean.

Finally, it is my view that the North is able to offer a wide choice of jobs involving most types of hardware and covering a range of systems applications suit most people's tastes.

It is an area with much to offer over and above work, and speaking to immigrants from the South no longer believe that the world ends socially, culturally and economically passing the mystic line of the north of Potter's or is it Watford?

By IVOR NORTON

The author, who is managing director of Ivor Norton Management Services Ltd, of Harrogate, says the North is able to offer a wide choice of jobs involving most types of hardware, and covering a range of systems applications to suit most people's tastes — and the area has much to offer over and above the work.

to advance their careers whatever their preference in terms of company activity and hence the type of applications on which they wish to work.

There is much activity in the manufacturing industries which gives plenty of opportunity for those who wish to specialise or gain experience in the area of production control and

largest and most well developed in the UK.

Finance, banking, insurance, building societies, public utilities and government bodies are also well to the fore.

For people interested in the sales and marketing side of the industry there is ample opportunity both for sales executives and for software support staff.

Having given a brief

REGIONAL MANAGER

Small Business Systems - Product Manager
PACKAGE £15,000+ CAR, BUPA

Our client is a very well established International company with an enviable record of success, both world-wide and in the UK, in the small business systems field, and wishes to recruit a Regional Manager to be based in Leeds.

The Company is well established with an excellent customer base which is rapidly expanding. The products are amongst the best in their field and are recognised throughout the industry as competitively priced.

The rewards for the successful candidate, in addition to the opportunity for personal career growth, will include a remuneration package of not less than £15,000, which for an outstanding candidate could be considerably more, plus executive car, BUPA, Pension and sickness benefits. If appropriate relocation expenses will be reimbursed.

This is a very senior position and interested candidates should contact Ivor Norton with full details quoting reference CW/79011 to arrange an initial discussion. Complete confidentiality is assured and no details will be disclosed to our client without the express permission of candidates.

The Regional Manager will have full profit responsibility for his region which simply stated covers the whole of Northern England. Responsibility includes all sales activity, software support and regional administration.

The successful candidate must have an outstanding track record in computer, mini-computer or business equipment sales. This is an ideal opportunity for a sales manager in VRC/small disk based systems who now wishes to advance his career by undertaking full regional responsibility.

Ivor Norton Management Services Ltd

52 Shaftesbury Avenue, London W1V 7DE. Tel: 01 734 8862 (24 hour answering service). Harrogate: 01423 66628 (24 hour answering service).

A number of clients located throughout the North of England who are major computer users have a requirement for staff at various levels of experience within most of the following job categories.

There is a wide range of vacancies and the hardware covers most of the major manufacturers.

Whilst the majority of the vacancies we are seeking to fill come within the systems development function there are also vacancies for senior operations personnel.

Salaries will be offered which reflect the qualifications and experience of the successful candidates. In addition in a number of cases attractive bonus schemes are in operation and if relocation is necessary expenses will be reimbursed.

We will be bringing the opportunities to you by holding informal interviews at major centres throughout the North of England all next week. Please call at your most convenient location and ask at the hotel reception for Ivor Norton between 4.30 pm and 9.00 pm on the dates shown:

LIVERPOOL

Monday 5th March 1979
Holiday Inn
Paradise Street
051-709-0188

MANCHESTER

Tuesday 6th March 1979
Portland Hotel
Portland Street
061-228-3400

NEWCASTLE

Wednesday 7th March 1979
Swallow Hotel
New Gate Street
0632-25025

LEEDS

Thursday 8th March 1979
Metropole Hotel
King Street
0532-450841

UNABLE TO MAKE IT


If these dates and times are inconvenient or if you prefer to arrange a formal appointment please telephone Harrogate 66628 (reverse charges) or write stating job interest and preferred area to Ivor Norton Management Services Ltd., FREEPOST, Harrogate, HG1 5BR. We will then arrange to meet you at a mutually convenient time and location.

FOR CANDIDATES NOT RESIDENT IN THE NORTH

In the next few weeks we shall be visiting various locations throughout the UK and if you are considering moving to the North of England or would just like to find out more information about job opportunities in the North please contact us by telephone or FREEPOST. We will then arrange to meet you for an informal discussion either about these vacancies or to advise you generally about the career opportunities and general amenities in the North. Our help and advice is free.

Ivor Norton Management Services Ltd

RECRUITMENT CONSULTING DIVISION
62 Shaftesbury Avenue, London W1V 7DE. Tel: 01 734 8862 (24 hour answering service). Harrogate: 01423 66628 (24 hour answering service).

VICTORIA APPOINTMENTS LIMITED 

WARRINGTON

1 Systems Programmer **c. £7,500**

1 Analyst/Programmer **c. £6,500**

1 Programmer **c. £5,500**

Our Client, a multinational European manufacturing organisation developing real-time systems in an expanding on-line European network based on an IBM 370/148 (shortly to be replaced by a 3031) at their new purpose-built DATA CENTRE, now requires:

OS/VS1 Systems Programmer to work within a small specialist team responsible for providing a service to application development groups on all aspects of Database and data communications design including system generation, software package evaluation, General Operations Support, development and maintenance in an OS/VS1 environment.

Analyst/Programmer with approximately 3 years' COBOL experience (OS/JCL and CICS would be a distinct advantage) to join a project team engaged on the development of on-line Order Processing and Inventory Control.

Programmer with sound COBOL experience. Again OS/JCL and CICS would be advantageous.

The Company is actively pursuing a policy of major developments and expansion in on-line / T.P. area.

Terms and conditions of employment are second to none including four weeks' holiday, bonus scheme, etc. Ref. No. CW20279

For an application form in respect of this and many other vacancies please contact Miss Val Halliwell, Victoria Appointments Limited, 24 Mosley Street, Manchester 2. Tel: 061-236 7319 (24-hour answering service) and 061-236 7417 or home 061-440 8134.

Northern Regional Health Authority

Computer Programmer

Applications are invited for the post of computer programmer in the Authority's Statistical Section. The successful candidate will join a small team working on a variety of applications in the statistical operational research and clinical research fields.

Candidates should be of graduate or equivalent status and must have pursued a course with a substantial mathematical or statistical content. Practical experience of programming for ICL computers, and of the George III operating system would be an advantage, but is not essential as training will be given.

Salary scale: E3452-E4421 p.a. (New entrants to the N.H.S. will normally commence on the minimum of the scale).

Application form and job description available from the Regional Personnel Officer, Northern Regional Health Authority, Bentfield Road, Walkergate, Rotherham upon Tyne, S62 4PY, to whom completed applications should be sent by 14 March, 1978.

UNIVERSITY OF NEWCASTLE UPON TYNE
NORTHUMBRIAN UNIVERSITIES
MULTIPLE ACCESS COMPUTER

(1) PROGRAMMING ADVISER
(2) TEMPORARY SYSTEMS
PROGRAMMER

(For a period of 3 years only)

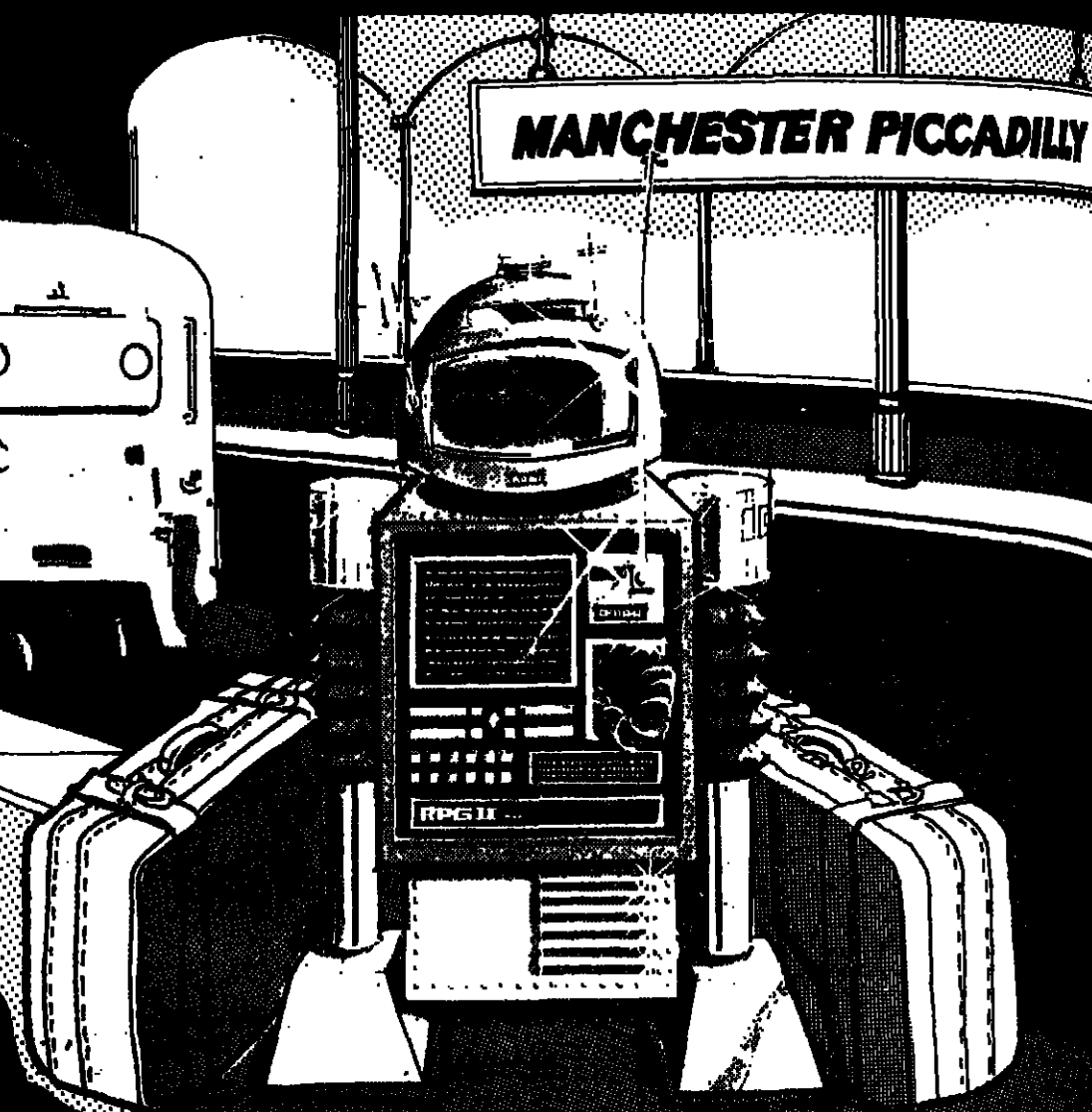
Applicants should have a strong understanding and sympathy with both research workers and students, and a desire to extend the knowledge and use of computers. Users of the service come from many different universities and cover a wide range of academic disciplines. The Computing Laboratory has excellent facilities including powerful IBM hardware with interactive capability and a large repertoire of library programs.

The applicant should be male or female of the following scales, according to age, qualifications and experience. Range 1A: £3,885-£6,560 per annum. Range 1B: £6,580-£7,784 per annum. Membership of the appropriate University superannuation scheme will be required.

Further particulars may be obtained from the Senior Assistant Registrar, The University, 8, Kingston Terrace, Newcastle upon Tyne, NE1 7RU, to whom applications (3 copies) together with the names and addresses of three referees, should be lodged not later than 22nd March, 1979. Please quote reference CW.

More sound advice from ARPEEGEETO

"Manchester's
a great place for
RPG II Programmers
with the future in mind"



'Didn't I tell you Altergo Business Systems would go a long way?'

'It was inevitable with all they had going for them.'

'You see, unlike a lot of companies who shackle their programmers to out-dated hardware — Altergo were prepared to make an investment in RPG II systems. They made sure they kept abreast of all the latest developments in computer technology, and they always provide their Programmers with all the necessary professional facilities to tackle one new project after another for an incredible diversity of clients in all areas of industry and commerce.'

'And what's more they're prepared to pay them for both their experience and their problem solving expertise; and pay them the sort of salaries that encourages initiative.'

'Even though they're part of the most successful software house in the UK, their growth is phenomenal. Their reputation for quality and technical innovation has put the demand for their expertise at a premium. They can no longer

handle everything from London so they're opening up a brand new facility in Manchester to cover the whole of the north.'

'Which is what I want to talk to you about. This new venture is going to mean a spectacular ground-floor opportunity for ambitious, self-motivated men or women, living anywhere in the north of England, with the courage and management potential to take full advantage of it.'

'So — as long as you've got some sound experience of IBM machines ranging from System 32, 34 to System 3 Model 15D — take my advice and contact Roger Perkins or Jacquilyn Clark quoting AP/39 on 01-734 9681 (or 049-481 2713 after 8.00 pm) or Mike Carswell at our Manchester office on 061-707 4399. Interviews can be arranged at our offices in London, Birmingham and Manchester. Or write to: Altergo (Personnel) Ltd., Warwick House, 38 Soho Square, London W1V 5DF or Altergo Business Systems Ltd., Emerson House, Albert Street, Eccles, Greater Manchester.



LICENSED AS AN EMPLOYMENT AGENCY

altergo

BURROUGHS

B80-B800 B1700-B1800

GULF STATES PROGRAMMERS/ANALYSTS

The Company is a large Trading organisation based in Various parts of the Gulf States, and they are official Distributors for Burroughs Computers.

The jobs are for Programmers/Analysts based at their Head Office in Kuwait. Applicants will work on commercial applications. Experience on Burroughs equipments is essential and you should have programming skills in COBAL — 1 year's upwards.

Salaries are negotiable — tax free — free accommodation — bonuses are paid — generous holidays.

A detailed job specification is available on request.

Phone or write for an interview. Quoting reference MMH.



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LONDON W1M 4AJ PHONE 01-486 5644



On-Line Opportunities High Wycombe

Wilkinson Match Limited, a large international Company, manufactures and distributes a wide range of consumer goods which include such famous names as Wilkinson's Sward, Bryant and May, and Foster Grant. The Data Processing Department (based at High Wycombe) is currently developing a large on-line order processing and accounting system, using IBM hardware, and has the following openings, each offering excellent career prospects:

Project Leader from £6,500 p.a.

Ideally, you should have had a minimum of 4 years' systems experience, together with some project leading/supervisory duties. You will lead a small project team and handle projects from inception/design, through to implementation.

Project Programmer from £5,900 p.a.

If you are an experienced Programmer, looking for more than just coding and able to write some program specifications from Analysts' requirements, here is a real opportunity. You are likely to be involved in completing the more complex programs yourself so

that you won't lose touch with coding completely. You should have at least 3 years' commercial programming experience in RPG11 and CCP would be an additional advantage.

Management Services Analyst from £5,500 p.a.

If you have had a minimum of 2 years' Industrial O & M experience and some involvement with computer based systems here is an opportunity to develop your skills further within the D.P. field. Initially, you will be working mainly on the implementation of computer systems and some U.K. travel will be necessary.

For all these posts, benefits include paid overtime, company pension scheme, 4 weeks' annual holiday and relocation assistance will be given where applicable.

Interested men and women should telephone for an application form or write giving details of their age, experience and current salary to:

Miss Claire Symons, Personnel Officer, Wilkinson Match Limited, Sward House, Tottenham Road, HIGH WYCOMBE, Bucks. HP13 6EJ. Tel: High Wycombe 33800.

Wilkinson Match

ATTENTION PROGRAMMERS JNR. SYSTEMS ANALYST c £6,000

Our Client requires an analyst programmer with 18 months' exp. in any language to work on a small development team to train as a Systems Analyst. Mortgage facilities.

PROGRAMMER c £6,000

This rapidly expanding company requires a programmer with 3 years' exp. in any lang. to work on POP equipment. Excellent training facilities and benefits available to all staff. Mortgage facilities.

PROGRAMMER/ PROJECT LEADER c £6,500

This small ICL installation requires a programmer with a minimum of 6 months' exp. in COBOL. They will train you in PL1 and CICS.

COBOL PROGRAMMER c £5,500

This small IBM 370 also requires a programmer with a minimum of 6 months' exp. in COBOL. They will train you in PL1 and CICS.

For these jobs and many more, call us first EMMA or ELLER on 01-623 8401.



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FORTRAN
PROGRAMMER
required for immediate start
Excellent Development
Opportunity
ALL REAS.
Apply to:
Capital Appts.
637 5557 day, 636 9659 eve.

Operations Supervisor

West London
Salary from £5,500 p.a.

Looking for responsibility?
Interested in working with the new IBM 4331 (E Series) Computer?

Then consider the following:—
Wavin Plastics, market leaders in the production of specialist plastic products, wish to fill a key position in their Operations Area.

The job: Co-ordination, control and scheduling of an active Operations and Data Control section, including online processing and with an emphasis on service to users.

The successful applicant will have

- 5 years' IBM operating experience
- complete understanding of DOS/VS and JCL
- supervisory experience e.g. shift leader
- good communication ability
- own transport

Computer equipment: An IBM 4331 is planned to replace the current IBM 370/126 installation, using DOS/VS, CICS and POWER, and RJE links to two main sites elsewhere in the U.K.

Conditions: The working atmosphere is pleasant and prospects are excellent for the right candidate. Company benefits include subsidised canteen, pension scheme, sickness benefit, and 4 weeks' annual holiday.

Please apply in the first instance to Corinne Ingram quoting Ref. 2270/CW.

WE ARE ALWAYS INTERESTED IN HELPING YOU WITH YOUR CAREER

John Goldsmith
(Computer Recruitment) Ltd.
14 Buckingham Palace Road, London S.W.1
Tel. 01-628 6384 - 24-hour answering service

JOHN GOLDSMITH
(Computer Recruitment) Ltd.

RECRUITMENT
CONSULTANTS

SYSTEMS ANALYSIS Advanced Projects

LONDON W1 £5000-£7500

Are you looking for the opportunity of doing creative analysis work at one of the most advanced installations in London?

Our clients have a considerable volume of new projects on hand, and this has led to analysis openings at several levels, from Junior through to Senior. These appointments offer the opportunity to:

- learn advanced techniques such as Database, Transaction Processing and Communications, using a large mainframe.
- work to good professional standards in a well-organised environment
- be involved in a wide variety of projects of an interesting and often technically challenging nature

The posts will interest career-minded DP professionals, typically:

- Senior Systems Analysts with a sound computing background (gained on any applications and any hardware) who seeks to update their experience. Team leadership capability would be expected. (Ref. 872)
- Systems Analysts with one of two years' practical analysis experience, with the potential to absorb modern techniques. (Ref. 884)
- Trainee Analysts with a good educational background and a systems analysis diploma or a computing degree, or Analyst/Programmers who wish to move to pure analysis work. (Ref. 880)

Working conditions are good - modern offices and a staff restaurant. There will be a cost of living increase in April, and prospects are sound in a growth situation.

We are recruiting for these posts on behalf of clients. Please ring us for a confidential talk, quoting the appropriate reference, or leave a message on our answering machine after hours and we'll contact you.



EDP SYSTEMS 01.637
52-53 Margaret St. London W1N 7FF 5796

Disk Software Team Leader

North London To £8500

Our client, part of a large multi-national group, is currently developing a new range of highly sophisticated communications equipment.

Part of this new development involves integrating OEM disk drives via a microprocessor with the new central communications hardware.

They now require a Team Leader to control a team of Software Designers/Engineers and Software Programmers developing the specialised disk software for this new application. The successful candidate will be responsible for all aspects of the design and implementation of the software for both the hardware driver and the file manager.

Suitable candidates will possess in excess of 5 years experience in software development and have experience in I/O software development, information retrieval techniques or database implementations on small machines. Involvement in the setting up and controlling of a project team is desirable. Essential is a sound technical knowledge of software architecture and design and solid experience in an assembler level language.

Ideally candidates will be aged 25-35 with a degree and have the presence and ability to liaise with the various interface points both within the company and outside.

This is a rewarding and challenging role providing excellent career expansion and involvement in new areas of software and equipment using the latest techniques.

The company offers a good range of benefits which includes full relocation assistance if necessary.

To discuss this challenging new opportunity in more detail, telephone Morley Holliday or write in strictest confidence quoting reference MGH 2122.



**Lloyd Chapman
Associates**

123, New Bond Street London W1Y 0HR 01-4081670

The best equipment deserves the best support

Data Logic is one of the country's most successful, and fastest growing, systems companies. Our product markets include terminal and distributed systems, word processors and data communications equipment. Our target is to more than double turnover over the next five years.

Our Customer Engineering Division provides the nationwide field service our users expect. Its staff deal with hardware and software, with a wide range of state-of-the-art products, and with a diversity of user environments. The work is challenging, placing a high premium on initiative and experience.

Systems Engineer

The rapid growth of the Division has created the need for a Systems Engineer (ref CE/1) to provide specialist support to the field service force. He or she will have a degree in electronic engineering or computer science, followed by at least three years in a specialist support role with a mainframe manufacturer. This is an important new role within the Division, providing considerable career scope for an energetic and able individual.

Field Service Engineer: Oxford

We are looking for a Field Service Engineer (ref CE/2) to provide preventive and corrective maintenance at user sites in the Oxford area. He or she will have previous experience servicing computers and associated peripherals. An ONC or HNC in electronics or computing is desirable, but not essential. Whilst the position will clearly be of interest to engineers living in the area, relocation expenses will be paid should the successful candidate wish to take the opportunity to move to Oxford from elsewhere.

Both positions
will attract
an excellent
salary and
benefits, and
a company car.

**Data
Logic**

Write or call, quoting the appropriate
reference number: Kathy Martin,
Data Logic Limited, 29 Marylebone Road,
London NW1. Tel: 01-486 7288.

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MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

FIELD SERVICE ENGINEERS

SALARY PACKAGE: To £6k + car.

AREA: Glasgow, Edinburgh, Central Lowlands.

EXPERIENCE: Repair of Minicomputers and Peripherals.

OPPORTUNITY: A full Service Centre is to be developed in this area providing exceptional career progression opportunities for capable engineers.

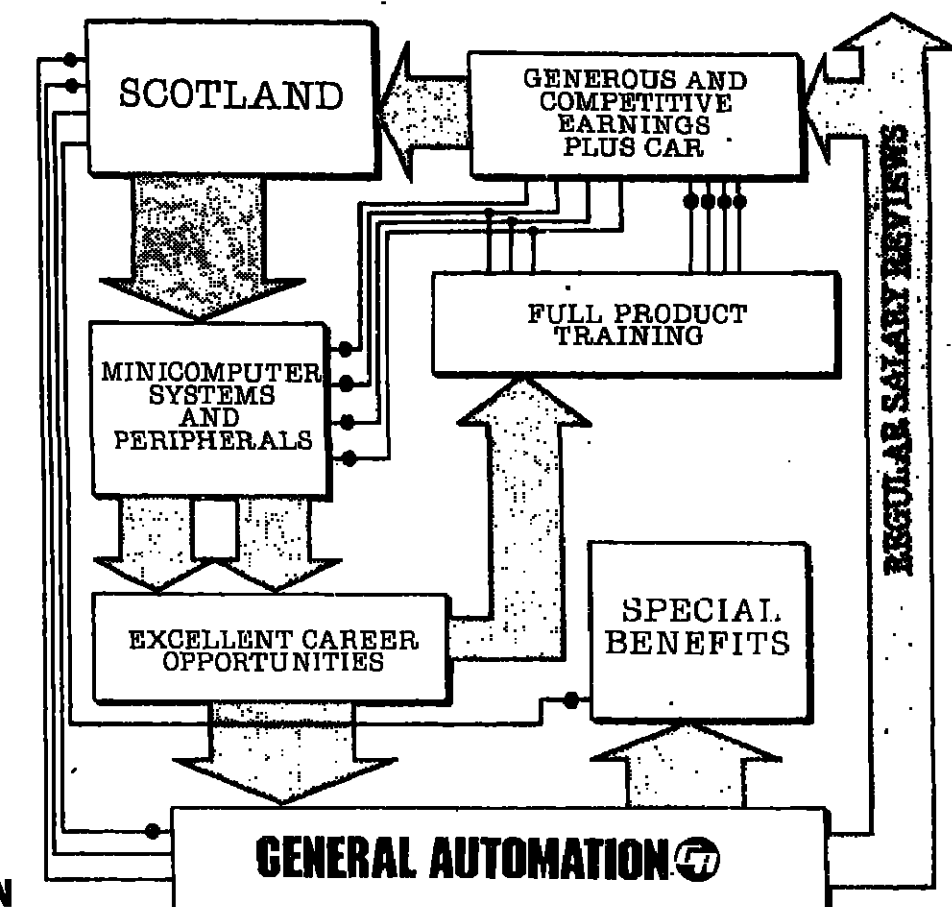
TRAINING: Full product training at our European Training Centre on a regular basis.

FORWARD-LOOKING COMPANY: The U.K. Division of this multi-million dollar American company is well established and is currently undergoing a rapid but controlled expansion. It is in the forefront of the latest technology, a fact which is regularly highlighted in the Trade and International publications.

SPECIAL BENEFITS: Assistance with relocation if necessary, free BUPA, free life insurance, excellent pension scheme.

For positive career advancement, contact Peter Gorton

Suite 201/6, Albany House, 324 Regent Street, London W1R 5AA 01-637 9611 **MANAGEMENT & EXECUTIVE SELECTION**



North London To £8500

Our client, part of a large multi-national group, is currently developing a new range of highly sophisticated communications equipment.

Part of this new development involves integrating OEM disk drives via a microprocessor with the new central communications hardware.

They now require a Team Leader to control a team of Software Designers/Engineers and Software Programmers developing the specialised disk software for this new application. The successful candidate will be responsible for all aspects of the design and implementation of the software for both the hardware driver and the file manager.

Suitable candidates will possess in excess of 5 years experience in software development and have experience in I/O software development, information retrieval techniques or database implementations on small machines. Involvement in the setting up and controlling of a project team is desirable. Essential is a sound technical knowledge of software architecture and design and solid experience in an assembler level language.

Ideally candidates will be aged 25-35 with a degree and have the presence and ability to liaise with the various interface points both within the company and outside.

This is a rewarding and challenging role providing excellent career expansion and involvement in new areas of software and equipment using the latest techniques.

The company offers a good range of benefits which includes full relocation assistance if necessary.

To discuss this challenging new opportunity in more detail, telephone Morley Holliday or write in strictest confidence quoting reference MGH 2122.



**Lloyd Chapman
Associates**

123, New Bond Street London W1Y 0HR 01-4081670

UNIVERSITY OF SALFORD
Computing Laboratory

GRAPHICS PROGRAMMER

The University of Salford acts as lead site for GINO-F. The post involves support and distribution of the GINO-F package and associated satellite libraries to 1900 and 2900 universities throughout the UK. The post involves a certain amount of travel within the UK and is initially for a period of 1 year but an extension to July 1982 is currently under review.

Applicants should possess a good honours degree and knowledge of major graphics package, GINO-F and GINO-F or 2900 experience and familiarity with university computing services desirable but not essential.

Salary on scale £3883-£6555 (under review), USS superannuation. Ref. CL/83/CW.

ELECTRONICS DEVELOPMENT ENGINEER

Required to assist the laboratory in the design and development of digital electronics services including microprocessor based systems. Applicants should have a degree in a relevant discipline and wide experience within the digital electronics field.

Salary scale £3883-£6555 (under review), USS superannuation. Ref. CL/84/CW.

Further particulars and application forms available from the Registrar, University of Salford, Salford M6 4WT, to whom completed applications should be returned by 8 March, 1979, quoting appropriate reference.

COMPUTER MANAGER

Earn up to £8,462

Surry

Based in the Treasurer's Department at Dorking this is a rare challenging opportunity for the right person to lead the Council's Computer Team. The present configuration is an ICL 2903 with EDS 80 Disc Drives, direct data entry, line printer and card reader.

A large number of systems are being processed, with development of on-line enquiries now being undertaken; 37 hour week with no shift. Removal and settling in allowances would be payable if you have to move house.

For an application form contact: Mole Valley District Council, Tel: Dorking 8001 Ext. 229

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Junior and Senior Operators with a minimum of 6 months' experience on any mainframe required urgently. Listed below is a small selection of current vacancies.

ICL	GH	Snr Op	2 yrs	£4000
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ICL	GH	Operator	1 yr	£3500
ICL	2900	Operator	2 yrs	£4000
DEC	PDP	Operator	2 yrs	£4000
UNIVAC	1108	Operator	1 yr	£3500
UNIVAC	9400	Operator	1 yr	£3500
H'WELL	GCOS	Operator	4 yrs	£4000
IBM	OS	S/Ldr	3 yrs	£4000
IBM	OS	Snr Op	2 yrs	£4000
IBM	OS	Operator	1 yr	£3500
IBM	OS	Operator	1 yr	£3500
IBM	OS	S/Ldr	2 yrs	£4000
IBM	DOS	Snr Op	2 yrs	£4000
IBM	DOS	Operator	1 yr	£3500
IBM	DOS	Operator	1 yr	£3500

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We are a large international firm of chartered accountants. Due to a recent merger, we are about to embark upon a major phase of development, and require the following staff:

**COBOL
PROGRAMMER**
c.£5,500

We are seeking a programmer with at least 12 months experience in COBOL to join a small team of computer professionals engaged upon the development of a multi-machine computer audit package.

**MARK IV
PROGRAMMER**
c.£5,500

If you have at least 12 months experience in MK IV, preferably under OS, then join us at the start of a major phase of development on a project running an IBM 370/158.

**TRAINEE
PROGRAMMER**
c.£3,000

Applications are invited from suitably qualified persons for the post of Trainee Programmer for which full training will be given.

For an application form, please write to or telephone: Craig Thrussell, Whinney Murray & Co, Turquand Barton Mayhew & Co., 57 Chiswell Street, London EC1Y 4SY. 01-628 6088.

Opportunities with CAP-CPP in the Scientific Field

If your background includes software related work in one or more of the areas listed below then we shall be pleased to hear from you.

Prototype development
Data acquisition
Real time simulation
Applied mathematics
and statistics

Command and control
Signal processing
Operational research
Numerical analysis

At this stage we are probably interested in applicants with two or more years experience but there will be some appointments for staff with less experience later in the year.

ABOUT CAP

Computer Analysts and Programmers was established in 1962 and has been profitable in each of the sixteen years of its operation. The Group now employs over 800 professional staff. All staff take part in our well established career development programme and project performances are carefully monitored to ensure that individual skills and aptitudes are taken into consideration on future projects. Benefits include at least 4 weeks holiday, a generous sick pay scheme, group sickness insurance, staff mortgage service, a share purchase scheme and regular salary and promotion reviews. Senior staff are eligible for our annual bonus scheme. Removal assistance is available where appropriate. Local interviews will be arranged where applicable. If you would like to apply please write or telephone, quoting reference number CW1176, to:

Tony Knott, Recruitment Manager,
Computer Analysts and Programmers (UK) Ltd., CAP House,
14/15 Great James Street, London WC1N 3DY.
Telephone No: 01-242 0021

Name _____
Address _____

CW1176

PROJECT LEADERS SYSTEMS ANALYSTS ANALYST PROGRAMMERS PROGRAMMERS

LONDON/HOME COUNTIES

to £9,000+ (U.K.)

Informatix have been retained by some of the U.K.'s leading Systems and Software houses to assist in the recruitment of their permanent D.P. Staff.

There are opportunities for all levels of computer professionals from Programmers with 1 year's experience to Systems Analysts and Project Leaders with 5+ years' experience.

The scope of the service provided by our clients include commercial, scientific, technical and software development on mainframe, minis and micros.

Applications range from financial processing, as custom-built systems and packages through to advanced on-line, real-time, message switching and compiler development.

All our clients offer excellent career prospects for ambitious people with the opportunity for overseas travel.

If you wish to be based overseas, our clients in Europe and the Middle East are seeking to fill similar positions. Ref: 9/1

INFORMATIX UNITED KINGDOM AND OVERSEAS INDEX

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SENIOR COMPUTER OPERATOR

£4142 per annum rising to £5305 per annum

COMPUTER OPERATOR

£3446 per annum rising to £4142 per annum
(Inclusive of Shift Allowance)

HAVE YOU HEARD WHAT'S GOING ON IN OXFORD?

We have an ICL 1903T under G3 taking care of our normal commercial processing needs. We have four CTL Modulars, a Prime 300 and PDP 11s.

The PDPs will meet the real time needs of local Oxford Hospitals and plans are in hand to develop real time systems for Blood Transfusion Services and Area Stores. All in all, there's a lot going on at Oxford!

But we can't do it on our own. We need you to help us and in return we can help you to develop your technical and managerial skills.

O.K. so maybe we can't pay the highest salary in the market place, but a nice working environment, interesting work,

good personal development and a management that cares is worth a great deal, probably a lot more than more money!

If you are interested in having a look round the RCU, ring Sharon Edmunds on Oxford 64861 Ext. 387, or for an informal chat about the posts, contact either Bob White, Ext. 564, or Alan Sand Ext. 563.

For further details and an application form, please ring quoting reference number V30/79: The Recruitment Officer, Oxford Regional Health Authority, Old Road, Headington, Oxford. Tel: Oxford 64861, Ext. 243/387.

Oxford Regional Health Authority

Contract Spot

COBOL PROGRAMMERS

Central & S.W. London

Phone Paula on 01-946 4424
Meteor Computer Consultants Ltd.

ajk

CONTRACT PROGRAMMERS AND ANALYSTS —

DENNIS ANDREWS WANTS YOU TO RING:—
01-402 0933

Especially if you are free now or will be soon.

AJK Recruitment Limited
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01-402 0933
Employment Agency/Licence No. 561

USA

Successful applicants will possess a minimum requirement of working experience in IBM OS COBOL together with associated JCL and dump-reading skills. Of these applicants, preference will be given to those who have experience in on-line IMS (DL/I) programming. Consideration will also be given to OS COBOL experience coupled with any of the following: DL/I data base design, IMS (DL/I) batch programming, CICS, PL/I and Assembler.

Salaries from £7k to £13k depending upon level of experience, plus relocation reimbursement possibilities.

Interviews will be conducted in London from March 3 to March 15. Applicants may be made by telephoning Ralph Payne at 01-237 8170 (March 3 to March 9) or by writing as soon as possible to Ralph Payne, Kensington Chase Hotel, W14 8LA, London, W8 6SF.

LONDON BOROUGH OF HAVERING

Borough Engineer and Surveyor's Division

SENIOR ENGINEERING TECHNICIAN

Grade Tech 4/5
£4530-£5368

Applicants should have HNC in Civil Engineering or a recognised equivalent and have experience in working in a transportation team, report writing and in using a transportation package including the running of computer programmes. Assistance with temporary housing accommodation and removal expenses will be considered.

Application forms and further details from the Borough Engineer and Surveyor, Technical Office, Spilby Road, Harold Hill, Romford, Essex RM3 8UU to be received by Friday, 2nd March 1979.

datascene international

SYSTEMS ANALYSTS

City to £7000

A major finance company based in the City wishes to recruit additional staff to work on the development of new projects for their expanding IBM 370 system. The individuals they are seeking will have at least two years' experience and must have implemented one major system. Any knowledge of CICS or PL1 would be a distinct advantage. In addition to a highly competitive starting salary the company offers an attractive benefits package and excellent working conditions.

Reference PG 9/1

COBOL PROGRAMMERS

City to £5000 + Mortgage

A major financial organisation with an expanding ICL 2900 system is seeking several COBOL programmers. These positions will be ideal for people with 12 to 18 months' experience on any mainframe, and who want ANALYSIS prospects. The company offers high starting salaries, Season Ticket Loans, Flextime and a Subsidised Mortgage.

01.439 7871

Reference PG 9/2

COMMERCIAL FORTRAN

North London to £7500

A large international company has undertaken a number of new development projects in the commercial and Real-Time fields, and so require several programmers with at least 2 years' experience in commercial applications using Fortran. Any Real Time experience would be of interest but this is not essential since full training will be given. The company offers varied and interesting work coupled with a full range of company benefits.

Reference HK 9/3

JUNIOR FORTRAN PROGRAMMERS

West London to £4500

A well known company in the Consumer Industry currently needs several Junior Programmers who wish to build for their own future. The minimum experience required is just 6 MONTHS FORTRAN programming on any mainframe or mini. Training in Systems Analysis will be provided and exposure to mainframes (an IBM 370/138), mini computers (on Prime 300's) and micro machines, will all ensure a wide range of experience and a 1st class choice of career prospects in the future.

01.439.7871

Reference HK 9/4

IBM & ICL MAINFRAMES

IBM SYS 3 £8000

Operations Manager required for International company based in W. London. Minimum of 4 years system 3 experience essential.

IBM 370 OS £5500

2 years + experience, including some JCL knowledge required for this senior Op/Shift leader post.

IBM 370 OS £4300

Operators with 6 mths + experience required by busy installation based in the city. Unusual shift pattern giving plenty of free time.

IBM 370 DOS £4500

Bureau in central London requires an operator with 1 yr + DOS experience. Perks include pension scheme and annual Bonus.

IBM SYS 3 £4200

Operator with 1 yr + experience for 2 shift working SYS 3/15 sits.

ICL 1900 £4000

City based installation requires an operator with 1 yrs experience preferably on G II. 2 shifts only and annual Bonus.

ICL 2800 £4250

Shift leader required with 2 yrs + 1800 or 2800 experience, by company based in N.W. London. 2 shift working only and some company product discounts.

DATA CONTROLLERS URGENTLY REQUIRED IN ALL AREAS. SALARIES £3000 - £8000.

SYSTEMS PROGRAMMER

City Negotiable

A large and highly respected financial institution is seeking a capable and imaginative OS or OS/VS Systems Programmer to work in their City based installation. They are using two IBM machines — a 370/148 and a 370/158, running under OS/VS in both Online (Data Base) and Batch Processing modes, hence a background in either discipline would be equally acceptable.

The ideal candidate would have some operating experience, with a general programming background, preferably in ASSEMBLER or PL1, as well as a minimum of around 18 months in OS or OS/VS Systems Programming. Since there is a heavy commitment in the Stocks and Shares field some exposure in this, or in any other financial area, would be an advantage.

Salary will be totally dependant upon ability and experience and will not prove a limiting factor for the right person, so if your experience tallies in any way please contact us at once.

01.439 7871

Reference PG 9/5

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ICL 1900 OPERATORS

East London to £3800 + BONUS

Our Client, the east London Computer Centre of a large Service Organisation requires operations staff with 6 months' 1900 experience. The hardware at present consists of a 1904A running under GII. A replacement 1904S, is planned later this year with a 2860 next year.

The company can offer excellent career prospects, to ambitious operators. There are opportunities for proficient staff to move off shift into Programming, Production Control or Technical Support after a period of 2 years.

Other benefits include a quarterly productivity bonus scheme, opportunities for overtime, subsidised staff restaurant, pension scheme, and midweek rest days etc.

For further details call

Mike Harmer on 01.439.7871

PL1 PROGRAMMERS

West End to £5600 + Mortgage

A leading commercial organisation with an expanding 370/135 installation in the West End is seeking a number of PL1 programmers to work on a variety of new and existing projects. The positions are ideal for enterprising young programmers with at least twelve months experience on IBM Hardware. A knowledge of OS/VS1, although not essential, would be a distinct advantage. The company offers a first class salary, and fringe benefits include Flextime, Season Ticket Loans, and a Subsidised Mortgage.

Reference PG 9/6

RPG II ANALYST/PROGRAMMERS

City to £8000 + Mortgage

RPG II people at all levels are needed for this financial company based in the City. The experience required varies from 18 months to 5 years, covering PROJECT LEADERS, ANALYSTS and PROGRAMMERS. TP and Data Base work will be involved, promotion prospects are superb, and benefits include LV's, Free Pension, Season Ticket Loans, and Subsidised Mortgages.

01.439.7871

Reference PG 9/7

PDP 11 PROGRAMMERS

London & Home Counties to £8000

If you have had at least 3 years' experience of programming on PDP 11's we have many vacancies which will be of interest. Your experience should include programming in either BASIC + BASIC + 2 ASSEMBLER or FORTRAN under RSTS, RSX11 etc. Applications vary from highly technical to commercial and telecommunications. All positions offer excellent salaries, combined with the opportunity to progress in your particular field.

Reference HK 9/8

MINI ASSEMBLER PROGRAMMERS

City to £7500

An International Banking organisation in the heart of London is seeking MACRO ASSEMBLER people with a minimum of 2 years' experience. The company uses DEC PDP11 equipment, and is currently developing an On-Line System, so any experience in this field would be advantageous. Salaries will be exceptionally good, and the package will include a Non-contributory Pension Scheme, interest free Season Ticket Loans, an annual Bonus Scheme is in operation.

01.439.7871

Reference HK 9/9

OTHER MAINFRAMES

HONEYWELL GCOS £4800

Minimum of one years experience for senior operator on a large 66 system. Pleasant location and career prospects are excellent.

HONEYWELL OS-2000 £4500

18 months experience required for company in N.W. London. The main advantage of this position is no night shifts.

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At least three years experience needed for Senior Operator in an installation in C. London. A thorough knowledge of 1100 series is necessary for this no nights post.

UNIVAC OS 3 £4300

Senior operator with 18 months experience using OS3 is required for a fast developing site with two shifts.

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RPGII? COBOL? ALGOL?
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SYSTEMS ANALYST

HOLBORN — up to £6,500 p.a.

Derwent Publications is a major supplier of patent and technical information, primarily to companies in the chemical and associated industries.

An opportunity has arisen for a systems analyst to be involved initially in the design of systems to be installed on a recently delivered 256K Data General Nova 312. This processor will be used to drive an in-house network of online visual display terminals to create data for a new database.

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We are looking for somebody with about 3 years' experience in systems and programming, including some work with minicomputers, preferably with Data General hardware using BASIC. Experience of online systems, data base design and text retrieval techniques would also be useful.

This new post offers excellent career prospects and benefits.

Please write with abridged CV to:

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Data Processing Director
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Rochdale House
128 Theobalds Road
London WC1X 8RP



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Contact Karen Burdon on 024541-4255 or write to Anglian D.P. Services Ltd, Starfield House, Malden Road, Danbury, Chelmsford, Essex CM3 4QW

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K & H is seeking a person (30-40) with several years' experience in the implementation of computer based Critical Path/Project Control systems.

Please contact: K & H Business Consultants Limited, 9 Villiers Road, Kingston, Surrey, Tel. 01-548 6777.

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Major reorganisation of the Rank Xerox International Data Centre in Bushey has led to vacancies in our Central Customer Support Group which is responsible for supporting all aspects of our users' computer usage across Europe utilising our three computer centres in the U.K., France and Germany.

Each centre operates IBM 370/158's with OS/VS2 with a large Remote Job Processing network and a number of interactive VDU systems. Men and women are required at all levels in the three main sections of Customer Support as follows:

Batch Systems and Interactive Systems Support
Senior — with at least 4 years IBM OS experience and a detailed knowledge of IBM assembler.

Intermediate — with at least 2 years IBM OS experience and a knowledge of assembler or a commercial programming language.

Junior — with at least one year's IBM experience.

For the Interactive Systems Support positions, preference will be given to those with on-line experience.

Training and Standards Support
Senior — with proven ability in the area of EDP education, a detailed knowledge of IBM and experience in the compilation and control of Data Centre records.

Intermediate — with either proven ability in EDP education or IBM experience and a technical background.

Applicants for all these demanding positions must be able to demonstrate confidence in attempting to tackle any task.

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We also have a small number of vacancies for Trainees and candidates should have a good academic background and preferably some previous exposure to computing.

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So if you are a graduate with two years' programming

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Analysts & Programmers with solid experience of business systems are required in: Avon, Devon, Glos, Somerset & Wiltshire.

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circa £8000

The person appointed will be able to offer a broad background in computer software incorporating a sound knowledge of both DEC PDP11 processors under RSX11M, and data communications protocols. He/she will hold responsibility for efficiently running a project team, and guiding the development of an important new system. Reporting to the Software Manager the successful candidate will contribute to the future success of this highly respected organisation.

SOFTWARE PROGRAMMERS

£5000-£7000

Two enthusiastic programmers are sought who can offer thorough experience of programming DEC PDP11 computers. Reporting to the Project Manager, they will work on new systems development, and may subsequently provide software and applications support to users in the European market. These are rare opportunities to join a young go-ahead organisation with a dynamic and exciting future.

SW1/0103

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Tilbury, Essex
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We are now looking for an all rounder to play a major role in developing our System which is designed to deal with the information flow associated with the handling of containers between ship and shore.

The person we seek should have several years' experience as a Systems Analyst with programming ability in COBOL, Drive and communications are important whilst experience in real time operations, database operations or mini computers would be advantageous.

The system uses a Hewlett Packard 3000 with application software in COBOL and SPL. Phase 1 of the development is going live now and further development work both of the information system and other aspects of the Company's activities are envisaged.

Benefits include a subsidised Staff canteen, contributory Pension Scheme, free accident insurance, four weeks annual holiday.

For further details and an application form write to: The Personnel Supervisor, Tilbury Container Services Ltd., Northfleet Hope House, Site 41, Tilbury Dock, Tilbury, Essex. Tel. Tilbury 71141

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£3,000 to £4,300

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£4,500 to £8,500

LONDON & HOME COUNTIES
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DATA CONTROL CLERKS

To £4,000 Inc. NR. CITY

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SENIOR OPS/SHIFT LEADERS

£4,500 to £8,100 Inc. NR. FELTHAM

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£4,500 Inc. NR. ILFORD

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ICL 2800	Cobol	W. London	3 months +
ICL 2800	Cobol	W. London	3 months +
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Programmer for major Group conversion project in York and then Manchester

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We are currently engaged on centralising all computer work and now require an additional Programmer to work on this challenging conversion project. Initially the appointment will be based at Tynes of York but after about 6-9 months will move to our new Computer Data Centre in Manchester.

We are looking for a man or woman with at least two years' programming experience using COBOL and preferably with some knowledge of Honeywell equipment.

Salary will be c. £5,000 per annum depending on experience with an attractive range of benefits including generous discounts on Group products.

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OPERATIONS

LONDON, W.1 £5700-£6200

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OPERATIONS SUPERVISOR

DAY SHIFTS ONLY — 5-DAY WEEK

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You will probably have had at least five years' operations experience, including supervision, together with a thorough knowledge of 1900 Manual, Executive and George 2 operating systems.

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EDP SYSTEMS 01.637 5796
52-53 Margaret St. London W1N 7FF

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Applicants should normally be under age 30 and have a degree or equivalent in an appropriate subject. Applicants will be at Scientific Officer or Higher Scientific Officer level depending on qualifications and experience.

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Please quote reference 50/CU/78/1

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Applications are invited for the above post which is offered for one year in conjunction with an SRC sponsored investigation into the optimisation of large programs on ICL 2900 series computers.

The work will involve studying the interaction of the program with the operating system and the reprogramming of sections of them. A computer science graduate would be preferred but other graduates with adequate programming experience will be considered.

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Matthew Hall

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A new appointment with the opportunity to broaden your experience and to move into the challenging environment of Data-Base.

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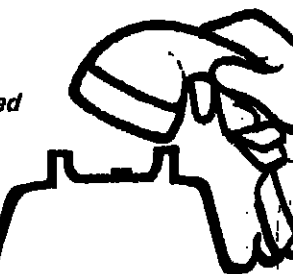
THE POSITION

Based in Leicester the position involves:

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- * enjoying the benefits of on-line development aids.

If you would like to discuss this position, please telephone (reverse charges) our Data-Base Specialist, Charles Goodwin, who will be pleased to hear from you. During the evening, Charles can be contacted on Swinford 678.

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Analyst/ Programmer

We are part of the £80 million Pritchard Services Group and need a capable analyst/programmer to play a key role in the development of systems, using his/her initiative with the capability of working closely with user departments.

Applicants should have experience of programming ICL 2902/4 or 1900 machines in Cobol with knowledge of file-processing techniques.

We offer an attractive salary in the range £8,000 to £8,500 according to age and experience, plus good conditions of service.

Interested? Please write to David Westcott, Personnel Manager.

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SENIOR ANALYST To £6500 + car
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RPG II PROGRAMMER £6,000
Two years' RPG II experience is required to join this exciting and challenging DP team, working for a successful financial company with a bright future, a bonus scheme, subsidised meals and other benefits. Salary range £5000-£6000.

Please phone for an application form

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Applications, including the names of two referees, should be sent by 23rd March, 1979, to the Assistant Secretary (UO), University of Surrey, Guildford, Surrey.

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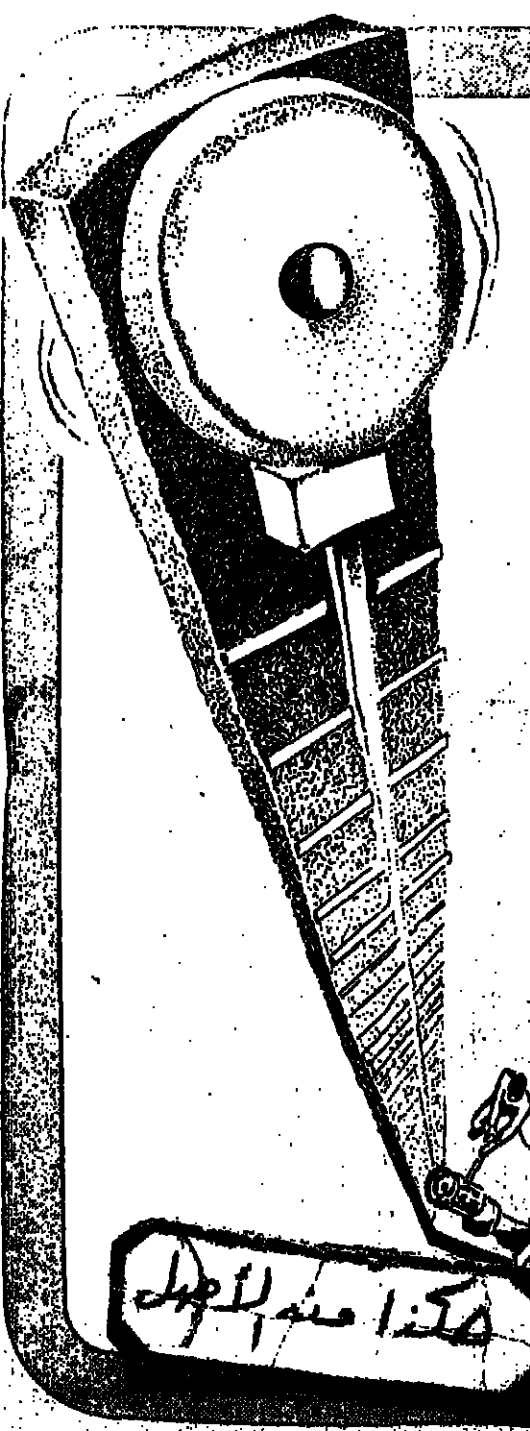
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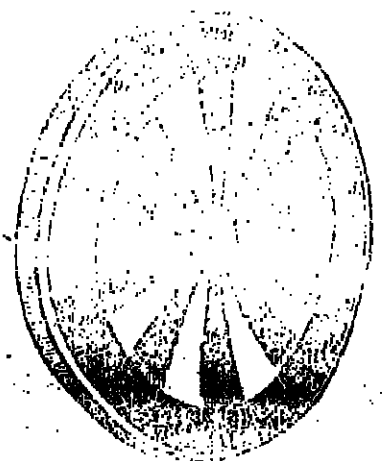
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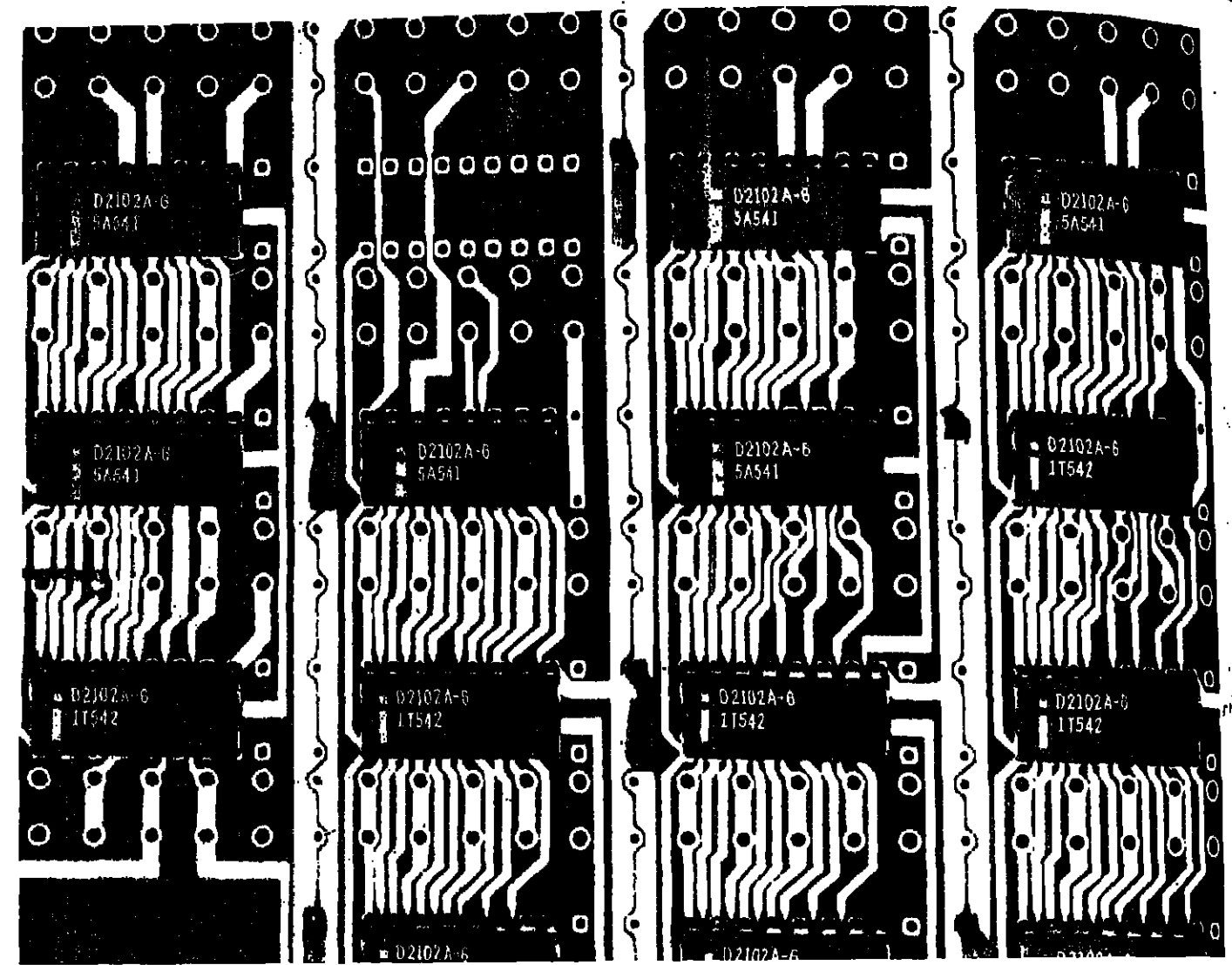
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The Company operate on IBM 370 computer running under COS/VS with power/PJE and CLICS. Hardware software are constantly under review and being upgraded to meet the growing demands for computer-based systems within the Company.

Conditions of Employment are attractive and include a Contributory Pension Plan with flexible options where appropriate.

For further information and an application form, please write or telephone:

PERSONNEL DEPARTMENT
McDERMOTT SCOTLAND
P.O. BOX 5
INVERNESS
Telephone: ARDERBIE 2801, Ext. 408

SOFTWARE ENGINEERS/ PROJECT ENGINEER

We currently have vacancies for two software engineers to work on M8800/PDP11 projects. Assembler experience is necessary, while CORAL 66 would be an advantage. Quote Reference: CW/SD

A vacancy also exists for a project engineer for microprocessor based products. Proven microprocessor hardware design experience required (preferably Motorola 6800). Project Management Experience would be an advantage. Quote Reference: CW/KM

Apply to:
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Fortronic Limited
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Hillend, Dunfermline
Fife, KY11 5JW
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Up to £8,085

International computer company requires Technical Systems Analysts, to join small team responsible for Operating-Systems-Software in a large computer complex based in Central Scotland

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Salary £4641 - £5991 pa.

The Electricity Council is the central co-ordinating body of the electricity supply industry in England and Wales.

You will join a group which provides a computing service to the Economics and Forecasting Branch and various other Branches within the Electricity Council.

The work of the Group is highly varied and currently includes work on interactive time series data base, survey analysis, library keyword indexing and weather correction of electricity sales. Most of the work is run on a twin IBM 370/158 system via a GEC 4070 RJE computer which has on-line program development facilities. Main languages used are FORTRAN and COBOL under IBM 370 OS. Some use is also made of time sharing-bureau.

You should have at least two years' programming experience. Please write giving details of age, qualifications and experience including languages, hardware and application areas with which you have been associated quoting CW/24 to:-

Duncan Ross,
Recruitment & Development Officer,
The Electricity Council,
30 Millbank, London SW1P 4RD.

ELECTRICITY COUNCIL

PLESSEY Peripheral Systems, Europe

Plessey Peripheral Systems is a world leader in the mini/micro computer systems, add-on memory and peripheral business, with its headquarters in California, and offices in most European countries and throughout the world. Due to our continuing expansion programme we are offering challenging opportunities throughout Europe. Applicants should have a mini/micro background, preferably with PDP 11's and be keen to keep up with the latest technology. Appointments are at various levels with attractive salaries - better than your present one - foreign travel opportunities and large company benefits.

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Practical systems programming background would be an advantage. Several openings in the UK and Germany, with foreign travel possibilities.

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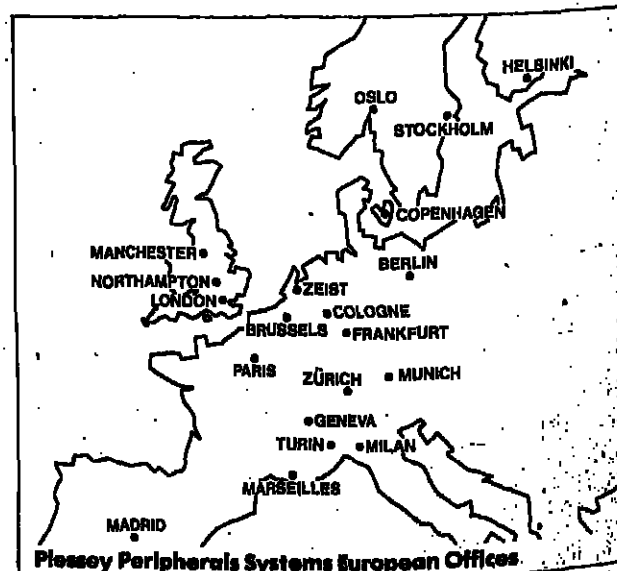
to run our Education Department.

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Engineers to maintain mini/micro computers and peripherals. PDP 11 maintenance experience is necessary. Opportunities in Belgium, Germany, Switzerland and Scandinavia.

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Area Sales Manager (Southern)



Write now for details to John Lemar, Personnel Manager, Plessey Peripheral Systems, Water Lane, Towcester, Northants. Or telephone Mike Pringle during working hours on (0604) 63175 or in the evenings on (0295) 711023. For Sales, telephone Mike Brislind on (0604) 63175 or in the evenings on (0280) 702105.

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has first class offices in Central London and Guildford;
is 90 people strong;
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would like especially to hear from you if you can offer relevant current experience in design and development in the following disciplines:

- commercial (mainframes to micros);
- telecommunications;
- database;
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- basic software.

are offering good career structure, salary progression, bonus, share purchase plan, season ticket scheme and opportunity to widen your computing perspective.

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we can build TRIAD into major multi-million service group for the 1980s in which you would add to your current achievement by adding to ours.

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Write, or ring: Erwin Schneider
TRIAD Computing Systems Limited, 42 Kingsway, London WC2B 6EX. 01-831 7211

MYRIAD

SENIOR PROGRAMMER

NORTH WEST LONDON

To £6,750

Our client, a major bureau installation is anxious to recruit an additional Senior Programmer to support the planned growth in 1979.

The company provide a service to a wide range of industries and it is expected that the successful applicant can lend his experience to developing future applications to be used in a bureau environment.

The ideal candidate should have a minimum of two years' commercial COBOL programming experience, and must be capable of recognising and reacting to user requirements: The position provides an outstanding opportunity to join an enterprising installation where every effort is made to encourage team-leading potential.

The position offers excellent scope for advancement together with the opportunity to work on a variety of projects.

Ref: EN1/103

ANALYST/ PROGRAMMERS

BEDFORDSHIRE

To £7,000

Our client, a large and successful manufacturing organisation with a multi-million pound turnover are about to embark on their next stage of computer development. In order to ensure the effective implementation of this project within schedule additional Analyst/Programmers are required to join a professional team working to very high standards.

Although the company operate a large IBM 370 mainframe, applicants with relevant experience on other manufacturers hardware are just as eligible as a mature approach and sound manufacturing systems knowledge are prime requisites.

Successful applicants must possess a minimum two years COBOL programming experience together with a least one year's analysis involvement, in return for which attractive career progression and company benefits are offered.

Ref: N1/103

LEAD PROGRAMMER

BERKS/BUCKS BORDER

To £6,000

We are seeking an IBM programmer with a minimum of two years' experience of COBOL. Ideally you will be keen to lead a small programming team and gain in-depth technical involvement in real-time programming with database and communications applications. Extensive training in software will be given and the opportunity to develop your career into either analysis or alternative database and software design are very real possibilities.

The company, a well-established engineering concern, is currently developing a broad range of on-line real-time applications in a project oriented environment. These positions both offer considerable career potential with a company committed to technical development of computer personnel. Relocation assistance, five weeks holiday and an excellent staff canteen together with a busy professional working environment make this an excellent career opportunity.

Ref: E2/O103

IBM OPERATOR FOR TECHNICAL SUPPORT

SLOUGH

£5,000-£8,000

A new position has recently been created with this busy Engineering Company, by the installation of a new IBM mainframe. While several on-line application systems are currently being developed for the new machine a Technical Support Programmer is required to implement these systems on the new hardware. Working with OS-JCL and COBOL the successful applicant will implement these systems, trouble shooting run time problems and generally tuning the performance of the systems once established.

Although COBOL experience is required training will be given since, in the first instance, in-depth experience of IBM 370 operation and OS-JCL are of prime importance.

Company benefits, and conditions of employment are excellent, together with potential to move into a technical specialist role.

Ref: E3/O103

MYRIAD APPOINTMENTS LIMITED

30 Fleet Street London EC4Y 1AA

01-353 0981

01-353 0981

Recruitment



in Informatics

Jnr/Snr/Mini/Micro Specialists Denmark

Salaries: £10K — £15K

Our client is the leading Scandinavian Systems and Software Development Group recognised as Market Leaders in its field. Owing to continued expansion in a wide variety of applications areas including Data Communications, Message Switching, Computer Networking and Mini Computer Software, a significant number of experienced career orientated personnel are urgently required.

Emphasis will be placed on technical involvement and in-depth experience in the areas of activity outlined above. Whilst a degree or equivalent qualification in either Computer Sciences or Mathematics is desirable, significant relevant experience will be considered in lieu. Of essence is a

solid Assembler background within a Mini Computer or Microprocessor environment. Project locations are primarily in Copenhagen and suburbs although candidates can work (should they so desire) in the Netherlands, Sweden or Germany. Of prime importance is demonstrable enthusiasm to relocate to Denmark for an extended period. Every assistance will be given in relocation, including the cost of removal of all personal effects. Initial accommodation expenses and a resettlement allowance.

Interviews will be held as soon as applications are received and offers of employment will be made within 10 days of interview.

Analysts & Programmers Inner/Greater Manchester

Salaries: c £6K - £8.5K

Our client is a major International Company recognised as market-leaders in its field and has retained Logistix to assist in recruiting the following key project team members — Real-Time Mini Programmers, Data Base Designers, Communications Programmers and Applications/ Software Programmers. Experience of any of the following will be especially welcome: RSX 11, RTL 2, Assembler, PL-1, COBOL, IMS DB-DC. For those who enjoy overseas travel there will be ample

opportunity to work at the company's E.E.C. offices in Sweden and the Benelux. Successful candidates must demonstrate qualities of leadership potential, determination and be self starters. It is expected that all staff should have the ambition to achieve Project Management status quickly.

Interviews will be held at one of the company's three UK offices most convenient to the candidates residence.

RSX 11 Programmers Netherlands

Salaries: £10K - £15K

Many of the forefront developments in Mini Computer Software and Data Communications are emanating from Europe and if you aim to move into frontier technology the opportunity arises to join a highly reputed Systems and Software Development group engaged in prestigious projects in the areas of Data Communications, Message Switching, Networking and Process Control.

Existing and new project teams require Consultants, Systems Designers, Senior Analysts, Analyst/ Programmers and Programmers with relevant experience in at least one of the above areas of activity. In particular, extensive Mfi Computer Assembler experience is essential. Successful candidates are likely to be aged between 22 and 35

years with a degree or equivalent (Computer Sciences or Maths) or extensive relevant experience in lieu.

You will most certainly contribute valuable expertise to this industrious group whilst expanding your own threshold of experience through working closely with other professionals at your own level.

Our client will pay full relocation expenses for you and your family and provide a generous resettlement advance in addition to meeting the costs of temporary accommodation pending location of permanent housing. Numerous other benefits contribute to make this a very attractive opportunity.

Scientific Programmer Italy

Salary: £10K - £12K

THE CLIENT: A multi-national Research and Development Institution is further expanding its team strength in the areas of scientific project implementation and requires several permanent scientific Programmers with Mini Computer Assembler or Fortran experience. Incidentally, we particularly wish to speak to candidates with current or very recent HP 2100 involvement.

Numerical Analysis, Image Processing and Operational Research. The scope and involvement of these applications is likely to be both challenging and interesting and is certain to push the horizon of technical sophistication to the limit.

THE PACKAGE: In addition to a very realistic salary the company also provides full relocation expenses, medical insurance and pension schemes as well as initial paid accommodation expenses for you and your family. Interviews will be held in London during mid and late February and offers will be made by the end of the month.

Small Machine Programmers Central & N.W. London

Salary: £5.5K - £8K

A European manufacturer of V.R.C. and Office Business Systems seeks several additional Programmers and Systems Analysts who will be engaged in developing several new challenging commercial applications. The opportunity also exists to develop into IBM mainframe projects at a later date.

Software house/turnkey supplier or manufacturer. Particular hardware experience is much less important but, generally knowledge of Kenzie, Nixdorf, Olivetti or Philips is significant.

Salaries are above market rates and in addition to a comprehensive range of Company benefits including contributory pension scheme, sickness benefit, Project bonus and 4 weeks annual holiday. Interviews will be held in London in February and March.

Logistix, Freepost 32, London W1E 3YZ

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London W1N 9HALicensed by D.O.E.
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01-491 4636



Telex: 28800

SYSTEMS ANALYST £7,000

NORTH LONDON

The appointment is for a systems analyst with a good background in commercial data processing, preferably within a manufacturing environment. Candidates should have at least two years in systems analysis and previous programming experience.

Application areas of particular interest are financial, order processing and stock control where current methods are to be replaced with on-line systems. The installation is a Univac 90/30.

Our client is a major manufacturer serving the construction industry with a comprehensive range of nationally known products. The position is open to someone seeking a real involvement over a wide variety of tasks within the company's computer department. Location is North London.

Applications can be made in writing or by telephone to Miss Anne Sweeney at these offices—

01-582 2600



Modern Marketing Limited

Alamitic House, 93 Allport Embankment
London SE1 7UB
Telex 21407 MMHGRP G

Systems Software Engineers

Air Defence Communications &
Command/Control Systems
CALIFORNIA

Our client, one of the largest international organisations involved in the design and manufacture of electronics systems, offers outstanding opportunities in Southern California on exciting and exacting projects with generous rewards.

We require engineers able to perform the top down design leading to definition of software requirements for air defence, communications and command and control systems. This involves total software responsibility from conception to implementation, and the ability to document performance requirements in accordance with military documentation standards such as MIL-STD-490 for B5 software applications.

Experience must include a minimum of four years in a major UK aerospace or defence contracting company, and a relevant qualification.

Attractive starting salaries will be accompanied by generous relocation assistance for you and your family to the US. Interviews will be held in London in the near future.

If you are interested in exploring these opportunities, in strictest confidence, write, or, better still, telephone, quoting Reference No. 8188, to P. Stafford, Moxon Dolphin & Kerby Ltd, 60 St. Martin's Lane, London WC2N 4AP. Tel: 01-836 1500.

MANAGEMENT SELECTION

CLASSIFIED COPY

All classified copy should reach our offices no later than 5.30 pm on the Monday preceding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday.

Ring David Abbey for further details on 01-281 8018.

We're successful because our staff are

Data Logic operates at the forefront of computing, applying the very latest hardware and techniques to practical commercial problems. We cover the range from mainframes to the smallest computers. We are leaders in the use of microprocessors for applications that not so long ago required far larger machines. Several of our projects involve dispersed networks of ten or more minicomputers.

The exceptional scope of work is important to our staff. We can match their individual experience to their projects. Equally, we can ensure that each project adds to their experience. As

computing itself develops, so do they.

Over the past year Data Logic has grown dramatically in size, in scope of work and in reputation. Our expansion has meant unrivalled opportunities for career progression. We are not prepared to promote people before they are ready for it. But when they are ready — and we give all the assistance we can — the positions as senior programmer, senior analyst, project manager and consultant will be there waiting for them.

The reason is simple. We know that we are successful only if our staff are.

Senior Software Staff

(Ref PSJ01)

For mainframe, minicomputer and mixed processor systems, usually supporting terminal networks. Increasingly Data Logic's turnkey projects involve minicomputers at multiple sites.

Applicants must have at least five years experience including some work in consultancy, system design or team management. Substantial knowledge is required of either high level language implementation on a leading mainframe or assembler language development on DEC, Data General or other leading minicomputers. We are especially interested in experience of:

- database systems
- distributed systems
- data communications
- telemetry
- operating systems design and implementation.

Salaries will be up to £8,500, with a car allowance or company car for those at the top end of the scale.

There are vacancies at our Greenford, Birmingham and Manchester offices.

Programmers

(Ref PSJ02)

For both mainframe and minicomputer projects which include commercial applications, monitoring and control, and scientific analysis.

Applicants should have at least three years programming and/or analysis experience in high-level language or assembler on any leading mainframe or mini. Salaries will be in the range of £4,500 to £6,500.

Vacancies exist in our Greenford, Birmingham and Manchester offices.

Data Communications Support Engineers

(Ref CPJ01)

For sales and engineering support roles within Communications Products Division which markets the INTERTEL range of modems and Network Control Systems.

Applicants should have experience either in sales support for data equipment or in design for digital and analogue systems. A degree or HNC qualification is desirable.

Base location will be in Central London but high mobility will be essential and a car will be provided. Salaries will be in the region of £6,500.

Systems Support Staff

(Ref CEJ4)

For specialist support roles within our Customer Engineering Division, which provides nationwide field service for terminal and distributed systems, word processors and data communications equipment. The support staff deal with hardware and software, within a diversity of user environments. Each product represents the state-of-the-art in its area.

Applicants should have a degree in electronic engineering or computing science, followed by at least three years work in specialist support with a mainframe manufacturer.

Base location will be Harlow, Essex but high mobility is essential and a car will be provided.

Programmers

(Ref TSJ03)

To work on systems software, emulators and advanced packages for applications such as data entry, for Data Logic's PTS100 range of terminal and distributed systems. This is an outstanding opportunity to gain experience in the development of complex high performance standard software. Programmers will work in small teams, taking considerable responsibility for distinct functional areas of the total system.

Applicants should have one to three years experience of software implementation in high-level or assembler languages. A degree in computing science is desirable.

Location will be Harlow, Essex and salaries will be in the range of £4,500 to £6,500.

Write or call, quoting the appropriate reference:
Kathy Martin, Data Logic Limited, 29 Marylebone Road, London NW1.
Telephone 01-486 7288.

A Raytheon Company

STRATHCLYDE REGIONAL COUNCIL

GLASGOW Sub-Region

ROADS DEPARTMENT

SYSTEMS DEVELOPMENT OFFICER

Viceroy House, India Street, Glasgow
Salary Scale — APV — £5888-£8068

Applications are invited from persons with a Degree in Engineering, Mathematics or Computer Science for the above post at Headquarters. The successful applicant will be required to have had experience in the use of computer facilities in highway and structural design and management systems. Duties will include assisting users with applications and developing new techniques. Ref. G577.

COMPUTER SERVICES DEPARTMENT

SENIOR PROGRAMMER

(Fortran)
Hannah House, Anderson Cross Centre, Glasgow
Salary Scale — APV/IV — £4388-£5403

The Department of Computer Services provides time-sharing facilities and support to a large number of technical staff within the Region. Engineers, Architects, Statisticians and many other professional users have access to the Authority's main computers from a variety of terminals including graphical display units and plotters.

A Project Team within the Computer Services Department provides software support for these users, implementing and amending packages and extending these where necessary. The packages supported include engineering design, statistical analysis, technical time table production, network analysis and interacting graphics. The wide variety of users offers scope for applicants with relevant FORTRAN experience to broaden their experience in a stimulating and demanding environment. Ref. G784.

*These salary ranges are inclusive of supplement.

Application forms for Glasgow Sub-Region posts may be obtained from The Assistant Director of Manpower Services, 21 Gordon Street, Glasgow G1 3PS, to whom completed forms, quoting appropriate Ref. No. should be returned by 15th March, 1979.

R. M. O. McCulloch
Director of Manpower Services



Join our expanding team at Sun Life of Canada and apart from the interesting development work, you'll also share in a number of benefits which make life richer. There's a special staff mortgage scheme, free three course lunches every day in our own staff restaurant, interest free season ticket loans, flexible working hours which enable you to plan your day and evenings better and of course if you have to relocate, we'll help you with your relocation expenses too. Plus the security and other benefits you'd expect, working for one of the largest Life Assurance Companies in the World, with assets of over \$5½ billion.

Would you rather develop your own or look after somebody else's?

Senior Analyst/Programmer starting salary £6800 — £7250. Minimum of 6 years relevant experience, including at least 2 years in systems analysis.

Analyst/Programmer starting salary £5900 — £6350. Minimum of 4 years relevant experience, including at least 1 year in systems analysis.

Junior Analyst/Programmer starting salary £4800 — £5200. Minimum of 18 months programming experience.

Most of the work our team carries out (about 75% in fact) is development work, frequently using the VDU screens to develop programs direct. We do both on line and batch work operating an IBM 370/168 under MVS/BS2. In addition to that, we provide on-site training at all levels, using ASI packages.

If we sound like the sort of company you'd like to be part of, then come and meet us, we'd like to meet you.

Please contact: Sue Ives, Recruitment Adviser, Personnel Department, Sun Life of Canada, 2/1 Cockspur Street, London, SW1Y 5HL. Telephone: 01-930 5400 Ext. 223.

SunLife of Canada

If our terminals are so good why do our salesmen have to be so good to sell them?

Because the market we've chosen is big, expanding... and tough. Data Logic's terminal systems are sophisticated, designed for the most demanding computer users. To demonstrate the improvements they can bring to an installation requires a thorough understanding of the client's environment. And since many of our users operate IBM mainframes, IBM itself is one of our prime competitors. That alone means our sales executives have to be rather special.

We are looking for top Sales Executives to be based at our new corporate headquarters in Central London, or at our regional offices in Birmingham and Manchester. A sound D.P. background is essential, together with a proven record of selling computer equipment to large industrial and commercial organisations. He or she will have experience of

transaction systems, including order processing, and ideally of distributed processing. We are especially interested in knowledge of banking, insurance, the distribution industries and the public sector.

Salary and commission should give annual earnings of £12,000 plus, after an initial period, and a car will be provided. Our ambitious expansion programme, aimed at more than doubling turnover over the next five years, will ensure that the salary and career prospects will be outstanding for those able to seize them.

Relocation expenses will be paid for staff who need to move home.

Write or call quoting ref TS/03 and preferred base:
Kathy Martin, Data Logic Limited,
29 Marylebone Road, London NW1.
Tel: 01-486 7288.

Data Logic

LONDON BOROUGH OF BENT REDIFON PROGRAMMER/ANALYST

(£4,017-£4,431 inclusive)

We need a keen person to act as Programmer/Analyst in support of our Redifon Bookish Key-to-Disc system. In order to expand the use of this equipment as a mini computer. Though eventually the person appointed will be expected to work with the minimum of supervision, full Redifon experience is not expected as training will be given where necessary. The post will be attractive to a young programmer seeking to widen his/her experience. We use an IBM 370/148 as our mainframe computer and interface with it as envisaged. Generous location expenses are available. Interest free loans for annual all season tickets. Subsidised staff canteen, 35 hour week, flexible working hours.

Application forms from the Administration Manager, Room 705, Bent House, High Road, Wembley, Middlesex, UB9 5JH. Tel: 01-818 1371 (24 hour answering service). Reference number R25/JD must be quoted.

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Up to £7000
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Up to £6000

Preferably with IBM experience including Cobol. Our U.K. computer department at West Byfleet, Surrey, is expanding its development programme with IBM 4300 hardware and over the next 2-3 years will include on-line interactive applications (financial and commercial) for Head Office and a number of manufacturing locations in the U.K. If you would like to join a small successful team that is working closely with the years and would welcome an opportunity to make a major contribution to computer development in a progressive company then please contact: Brian Marshall at Van Leer House, West Byfleet, Weybridge, Surrey (Tel: 01-838 8111).

INTERNATIONAL SPORTS COMPANY LIMITED (Member of Dunlop Ltd.)

PROGRAMMER WEST YORKSHIRE

Our expanding Computer Department is a Programmer with one or two years Cobol experience to work on batch developments.

We currently run two ICL 2904 Computers EDS 80's and remote and locally. Competitive salary and benefits in good company practice.

Please apply in writing, giving details to date, to:

STEVE REDGRAVE, Group HRM Officer
International Sports Co. Ltd.
97 Bridge Road, Harrogate, West Yorkshire HG5 5NN



Sales Executives Accountants

Advance your career in sales and enjoy probably the best benefits package in the industry

The recent Jordan Survey on Britain's Top 500 Electronic Companies showed that CMG COMPUTER MANAGEMENT GROUP is the highest payer in the computer industry (front page Computer Weekly, 1st February, 1979) — but the benefits of working for CMG go much further than that.

CMG is now the largest independent computer services bureau in Europe. Privately owned by the employees, its unique style of management, and employee participation has generated vigorous growth which has tripled annual turnover to £12 millions in the last four years. It goes without saying that in this environment there are ample opportunities for career advancement.

We are seeking sales people to sell our range of commercial application packages already working successfully for over two thousand users. You will join a small but well trained and supported sales group who receive the following benefits—

£6,000-£14,000 p.a. Salary (not commission)

which will exceed your present total earnings and be reviewed annually plus,

- Free Life Assurance and non-contributory pension.
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- 21-26 days annual holiday.
- Profit sharing up to 10% of salary.
- Assistance with removal expenses.

Locations — London, Croydon, Manchester, Glasgow.

If you are a successful business equipment, systems or bureau sales executive, or a qualified accountancy wanting to enter sales then please contact: Elizabeth Attewell

SMR Sales & Marketing Recruiters Ltd.
Victory House, 99 Regent Street,
London W1R 7HB
Telephone: 01-734 9776

MULTI-ACCESS

On-line programming of a commercial system on a mini.
Two freelance programmers needed to start work urgently using high level language, location W1.
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CONTRACT PROGRAMMERS REQUIRED

Send C.V. and date available to: Widge Wood Software Services, Birmingham Rd., Southroppe, Norfolk NR11 8UY

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Sales Executives

You are seeking to advance your career rather than simply looking for another job then you need the objective guidance of an experienced sales executive who is totally conversant with all aspects of sales and marketing within the computer industry.

Although our activities are devoted to this area, we are not merely a recruitment organisation; we are the only company within the industry which also provides sales training, market research and product promotion.

We understand sales people because we have done the job our- selves for a total of over 25 years, and we know where the best job opportunities are because we have access to all the significant computer companies.

We give you a call if you need help of any kind; we believe there is still room for altruism in business. Who knows, you might even get to speak with TRADER.

A Sales & Marketing Services Company
TRAINING, PROMOTION, RESEARCH, RECRUITMENT
LONDON & MANCHESTER

THE SALES AND MARKETING BIT

FORECASTING V

'Rubber' figures mean loss of credibility

LAST week we were discussing the need to take two differing approaches to the generation of the sales forecast — an external one which is basically mathematical and an internal one which is on the basis of informed opinion.

We then discussed the relative merits of sales forecasting by extrapolation and the use of moving annual totals — although moving periods such as quarterly totals might in some situations be preferable.

In some ways the smoothing effect of the moving annual total tends not only to iron things out but also press things in. This particularly applies to identifiable and non-recurring exceptions or short-term trends.

For instance there may have been a period, of say six months, in a previous year when sales within a computer bureau were restricted due to the overdue delivery of an additional computer. There may also have been variations due to a particular influence on the potential smoothing is a mathematical device which is able to compensate for these kinds of special variances.

If you want to get really clever, then it is possible to use algebraic methods for evaluating the effect of one variance upon another, namely regression analysis, but I never got that ambitious.

Within the context of long-term forecasting there is a need to take into account the effect of both technological advancement and competitive products.

Correlation analysis takes into account the possible effect that the marketing of one product may have upon another — for instance, the influence of key-to-disc systems on punch cards.

Tied indicators are a very precise form of correlation where the sales of one product is a direct function of the sales of another; for example, floppy discs and cartridges are virtually dependent on the number of mini and microcomputers sold.

The application of some or all the methods of analytical and mathematical forecasting mentioned in this and last week's columns should eventually bring the sales manager to a sales forecast which he believes is a fair (fair/reasonable not fair/moderate) assessment of likely sales achievement for the coming year.

That is the external forecast. The other internal, opposing and just as necessary forecast, is a composite judgment of what is possible in terms of sales and production. This is achieved by creating the amalgam of customer, sales, production, and management opinion already discussed earlier on this topic.

The two forecasts should then be compared. They will seldom be the same but any severe deviation will indicate a contradiction somewhere which needs to be resolved.

The approach provides three significant benefits: 1. It checks the accuracy of the original sales forecast; 2. It crystallises the judgment and considerations of sales management; and, 3. It involves all those people who will be called upon to accept the commitment implied by the forecast.

Of course, the sales forecast is in itself only a beginning. There is then the estimation of related selling costs which will be added to other company costs in order to assess the profit forecast which is really the key to it all.

One personal feeling on the subject before closing: No sales manager worth his salt, having committed himself to a sales forecast, will, in my opinion, scrap it and replace it with some artificial figure, which neither he nor his people believe in, just because the number to the bottom right-hand corner of the company's budget doesn't please the managing director.

Reduce other company costs, take on the challenge of revenue over and above the call of duty by all means, but stick to the original forecast.

There's no better way of losing credibility with one's subordinates or superiors than dealing in "rubber" sales forecasts.

TRADER

Jargon book

THE British Standard glossary of terms used in data processing has been published by the British Standards Institution. It contains the terms and definitions of data media, storage and related equipment, and is available from the British Standards Institution, 2 Park Street, London W1A 2BS. Tel: 01-629 9000.

Bigger offices

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Puzzle Answer

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6 4 8 3
9 4 8 5 1
1 0 7 8 1 7

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PRIME

Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth

Block 28 (Ivory Tower Block)

Cleo's exploration of the disused mercury mine has led her deep into trouble. She has fallen through the ventilation shaft of an experimental laboratory hewn out of the rock.

SHE looked around her. The place was fitted out like an alchemist's den. A stuffed crocodile hung by chains from the ceiling. Its sharp teeth glinted in the pallid artificial light. Round the walls, like a big game hunter's trophies, were mounted the heads of various exotic species, mostly herbivores such as elk and antelope, though she spotted a black puma and a snow leopard among them. Here and there on the shelves she could see, pickled in jars of yellowish preservative, what she took for animals' brains. The foetid smell of formaldehyde pervaded the air. She had upset a bottle when she landed and the liquid was oozing across the floor.

At the far end of the laboratory, to her right, an android had put down the retorts and phials he had been busy with and was eyeing her with curiosity. "Aha!" he exclaimed, turning off his Bunsen burner. "Just what I want for my cross-breeding experiments—a human female of childbearing age!" Cleo didn't like what she heard.

He began walking towards her. She noticed first his style of dress. Eschewing the lab worker's sterile white coat, his garb was the epitome of trendiness. His pale lemon kaftan was patterned with intricate Arabic calligraphy, and unbuttoned at the top to reveal a grizzled expanse of chest hair. Against this virile moustache some sort of runic pendant hung on a leather thong round his neck. Hip-hugging jeans clung modishly to his middle-aged spread.

He stopped before he reached her and opened a refrigerator. In among the racks of biochemical specimens was a six-pack of beer. He pulled out two cans and handed one to Cleo.

"Here," he said, popping open his can, "have one." Cleo gratefully gulped down the ice-cold lager. He took a couple of swigs and then asked: "Who are you? I'm Mike Rose, Director of the Meta-Physical Laboratory."

"I'm Cleo Calculus."

"Well Cleo, if you will just finish off your drink and come this way, I'll show you what you have to do. It shouldn't take long; and it won't hurt a bit."

His polished bedside manner was at once so affable and



imperious that it had a mesmeric quality. She found herself involuntarily following him. He led her down to the other end where there was a little cubicle with a curtain which he drew aside.

"Just step in here and take off all your clothes. I'll be back in a minute," he told her.

Meekly, without question, she went inside, almost watching herself as a spectator. His steps gradually receded. There was the sound of a latch being lifted.

Cleo peeped out. At the other end of the lab, Rose was holding the door open to let in his assistant.

"Pitdown!" she exclaimed in surprise and delight, running out though she was half naked.

"You're acquainted, then," remarked Rose mildly.

"Of course," she replied. "It's Pitdown. But he can't be Pitdown's dad."

"Actually this is Neddy (short for Neanderthal). Pitdown's clone," explained Rose. "We always keep a spare copy."

Cleo gazed up at him. Pitdown's face was etched into

ibly in her memory. This certainly was the spitting image. He smiled down, hardly seeming a stranger.

"Now then, shake hands," Rose said. "Cleo meet Neddy Bigfoot. Neddy, this is Cleo."

"Pleased to meet you," said Cleo.

"Honnan tagon," replied the ape.

"He still speaks Esperanto," said Cleo. "Why don't you teach him English?"

"Too illogical," explained Rose. "He's more at home in pure third-order Predicate Calculus anyway; but I find it hard to keep up with him. Esperanto is a concession to my frailty: it's the least methodical language I can permit him to learn without polluting his mind with human values."

"But I can't talk to him," complained Cleo.

"Oh, you'll get along fine without it, I can see," Rose answered, "which is a pity in a way because I shall now have to abandon my plan to form a hybrid by mating human with Susquatch."

Cleo listened with relief. Rose was beginning to seem eminently reasonable.

"Yes," he continued. "I'm afraid you're no use to me. You're pregnant already."

"What?"

"Don't worry. I can tell before you can—less than seven days after the event. I only need one look. I'm the world's leading expert."

"Impossible!" she expostulated.

"Wait and see," he replied calmly. "Time will tell."

"But, I mean... I thought androids couldn't..."

Rose raised his eyebrows. "An android father, eh? Now you've got me interested again. Some of us can, you know. In the old days all they kept for cybernation was the brain and spinal cord; but modern thinking is that it's more economical to leave most of the vital organs intact."

Cleo blushed deep scarlet.

"You'd better go and put your clothes on again," suggested Rose.

While she was in the cubicle dressing, Rose called over: "Bigfoot will show you around while I decide what's to be done with you."

When she emerged the great ape beckoned and she went out through the door after him. She found herself on a metal balcony riveted into the rock. They stood at the edge of one of the catwalks that crossed and criss-crossed the vast subterranean cavern. She looked down at a hive of industry beneath. Automata of all descriptions (finite, deterministic, non-deterministic, pushdown and linear-bounded) scurried purposefully to and fro across the floor of the cave like ants, bathed by arc-lights from the vaulting roof. The whole place buzzed with incessant activity.

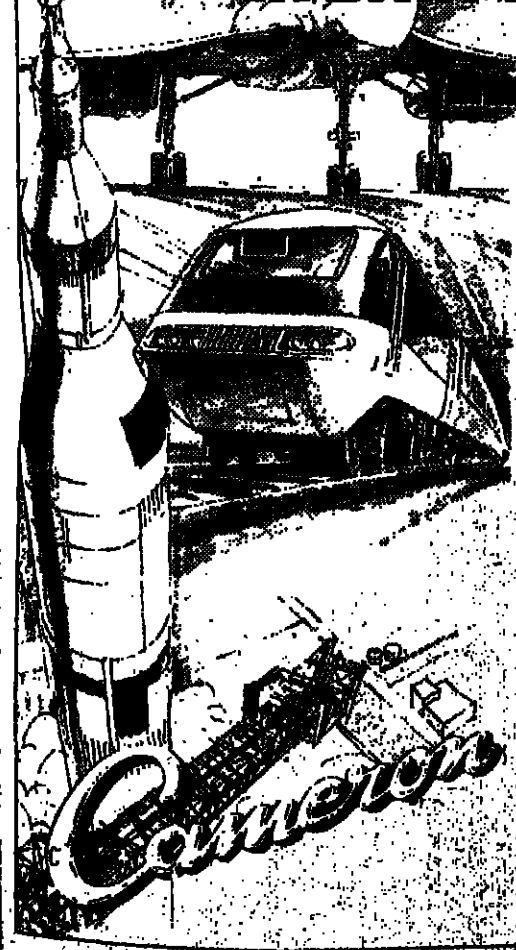
"Granda, jest?" inquired her guide.

"Granda," she replied. "Yes." Her mind was not on the busy workers scuttling below. She was thinking of the unborn child in her womb, wondering whether it would ever see the light of day, and, if so, how she would cope.

Is this now burden too heavy for her? Back to Hax next week

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